

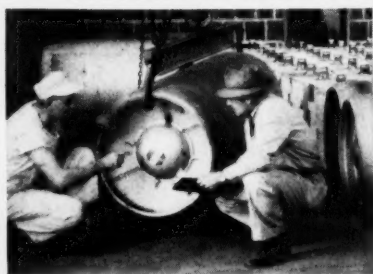
# Chemical

April 7, 1951

Price 35 cents

INDUSTRIES

# Week



◀ **Big push behind chlorine;**  
**NPA okays \$222 million ex-**  
**pansion ..... p. 9**

**Popped perlite; light, absorbent,**  
**cheap; looms as novel packing**  
**material ..... p. 28**



◀ **Business men query Washington:**  
**Why do many fat contracts go**  
**to middlemen, few to prime sup-**  
**pliers? ..... p. 11**

**Raw material shortages clamp**  
**ceiling on resins output ..... p. 31**



◀ **Better formulations, new applica-**  
**tion techniques, spur 2, 4, 5-T herbi-**  
**cide sales ..... p. 25**

FROM SHELL CHEMICAL

# ALLYL ALCOHOL

$$\text{CH}_2=\text{CH}-\text{CH}_2\text{OH}$$

...in tank cars and drums

Here are typical reactions of Allyl Alcohol that may suggest ways through which you can accomplish useful chemical syntheses:

Reactions involving THE DOUBLE BOND	Polymerization	Homopolymers Linear copolymers* Cross-linked copolymers*
	Halogens ( $\text{X}_2$ )	$\begin{array}{c} \text{CH}_2-\text{CH}-\text{CH}_2\text{OH} \\   \quad   \\ \text{X} \quad \text{X} \end{array}$
	Amines ( $\text{RNH}_2$ )	$\begin{array}{c} \text{CH}_2-\text{CH}_2-\text{CH}_2\text{OH} \\   \\ \text{RNH} \end{array}$
Reactions involving THE HYDROXYL GROUP	Organic Acids ( $\text{RCOOH}$ )	$\text{CH}_2=\text{CH}-\text{CH}_2\text{OOCR}$
	$\text{CS}_2$ and $\text{KOH}$	$\begin{array}{c} \text{KS}-\text{C}-\text{O}-\text{C}_3\text{H}_5 \\    \\ \text{S} \end{array}$
	$\text{H}_2\text{S}$	$\text{CH}_2=\text{CH}-\text{CH}_2\text{SH}$
Reactions involving BOTH FUNCTIONS	Oxidation	$3(\text{HCOOH})$
	Rearrangement	$\text{CH}_3-\text{CH}_2-\text{CHO}$
	Alkylation ( $\text{C}_6\text{H}_6$ )	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_2 \\   \quad   \\ \text{C}_6\text{H}_5 \quad \text{C}_6\text{H}_5 \end{array}$

\*Linear copolymers with mono-allyl esters, styrene and other singly unsaturated compounds; cross-linked copolymers with di- and tri-allyl esters of di- and tri-basic acids and with drying oils.

A 96-page book which summarizes the known properties and uses of Allyl Alcohol will be mailed upon receipt of your letterhead request. Samples of Allyl Alcohol for evaluation are available.

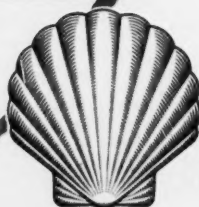
#### PHYSICAL PROPERTIES

Specific Gravity, 20°/20°C	0.8535
Boiling Point, 760 mm	96.9°C
Flash Point, Tag open cup	90°F
Tag closed cup	72°F

## SHELL CHEMICAL CORPORATION

CHEMICAL PARTNER OF INDUSTRY AND AGRICULTURE

Eastern Division: 300 Fifth Avenue, New York 18 • Western Division: 100 Bush Street, San Francisco 6  
Los Angeles • Houston • St. Louis • Chicago • Cleveland • Boston • Detroit • Newark



# Chemical Industries Week—

April 7, 1951

Volume 68 Number 12

OPINION	2
NEWSLETTER	5
BUSINESS & INDUSTRY	9
RESEARCH	19
PRODUCTION	22
SPECIALTIES	25
PACKAGING	28
MARKETS	29
BOOKS	33
BOOKLETS	36



PUBLISHER ..... Wallace F. Traendly  
EDITORIAL DIRECTOR ..... S. D. Kirkpatrick  
EDITOR ..... W. Alec Jordan  
EXECUTIVE EDITOR ..... Richard L. Demmerle  
MANAGING EDITOR ..... Howard C. E. Johnson  
ASSOCIATE EDITORS: John J. Craig, Herman W. Zabel, ASSISTANT EDITORS: Joseph Gordon, Ralph R. Schulz, REGIONAL EDITORS: Frank C. Byrnes, Chicago; J. V. Hightower, San Francisco; James A. Lee, Houston. ART EDITOR: Woodfin G. Mizell, Jr. EDITORIAL ASSISTANTS: Donald P. Burke, Theresa Hass, Leona Mahler. DOMESTIC AND FOREIGN NEWS SERVICE: McGraw-Hill News Bureaus in principal cities of the U.S. and throughout the world.

#### Consulting Editors:

Lawrence W. Bass Ernest W. Reid  
Benjamin T. Brooks Norman A. Shepard  
John V. N. Dorr Roland P. Soule  
Charles R. Downs Robert L. Taylor

Chemical Industries Week (including Chemical Specialties) is published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. Publication Office: 1309 Noble St., Philadelphia 23, Pa.

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N.Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions to Chemical Industries Week are solicited in the chemical and process industries only from management men responsible for corporate affairs, purchasing, sales, marketing, packaging, research or chemical functions. Position and company connection must be indicated on subscription order. Address all communications to J. E. Blackburn, Jr., Director of Circulation, 330 W. 42nd St., New York 18, N.Y. Allow ten days for change of address.

Single copies 35¢. Subscription rates — United States and Possessions \$5.00 a year; \$8.00 for two years; \$10.00 for three years. Canada \$6.00 a year; \$10.00 for two years; \$12.00 for three years. Pan American countries \$7.00 a year; \$11.00 for two years; \$14.00 for three years. All other countries \$20.00 a year; \$30.00 for two years; \$40.00 for three years. Entered as second class matter July 13, 1944, at the Post Office at Philadelphia 23, Pa., under the Act of March 3, 1879. Printed in U.S.A. Copyright 1951 by McGraw-Hill Publishing Co., Inc. — All Rights Reserved.

April 7, 1951

**KESSCO  
PRODUCTS**

**CHEMICAL  
SPECIALTIES**

## PLASTICIZERS

Cellulose, Vinyls,  
Rubber, Resins

## SOFTENERS

Leather, Rubber,  
Textile, Paper

## EMULSIFIERS

Cosmetics, Foods,  
Pharmaceuticals,  
Petroleum, Agriculture  
Insecticides

**KESSLER CHEMICAL CO., INC.**

ESTABLISHED 1921

STATE ROAD and COTTMAN AVE. PHILADELPHIA 35, PA.

# ACCULUTE

... for rapid, accurate preparation of Volumetric Solutions.  
... Laboratories requiring speed and accuracy are using Acculute with excellent results.

#### ACCULUTE SAVES TIME

—Open the ampoule—transfer the contents to a volumetric flask—dilute to volume (1000 ml)—your volumetric solution is prepared.

#### ACCULUTE IS RELIABLE

—Close control of the special manufacturing processes insures uniformity of the product. Acculute does not vary in chemical content—you can depend on it.

#### ACCULUTE IS ACCURATE

—Each ampoule contains the precise concentrated equivalent of the normality stated on the label. There is no need for subsequent standardization.

Cautious solutions are supplied in wax ampoules, others in chemically resistant glass.

Complete instructions for preparing Acculute solutions are furnished with each unit.

A special bulletin, listing Acculute concentrates with prices and discounts will be sent on request.



**ACCUTINT**

**pH TEST PAPERS**

simple, rapid, accurate

Write for complete information and prices.

**SARGENT**

SCIENTIFIC LABORATORY INSTRUMENTS · APPARATUS · CHEMICALS  
E. H. SARGENT & COMPANY, 4647 W. FOSTER AVE., CHICAGO 30, ILLINOIS  
MICHIGAN DIVISION, 1959 EAST JEFFERSON STREET, DETROIT 7, MICHIGAN  
SOUTHWESTERN DIVISION, 5915 PEELER STREET, DALLAS 9, TEXAS

**JAPAN WAX  
CARNAUBA**  
and substitute waxes

**CANDELILLA**  
PRIME, CRUDE,  
and REFINED FLAKED

ORANGE - BUTTON - BLEACHED  
DEWAXED  
**SHELLAC**  
Direct Importers  
from our own sources

**BEESWAX**  
AFRICAN CRUDE  
South American  
Bleachable

WM.  
**DIEHL**  
& COMPANY

334 W. 42nd Street  
New York, N. Y.

BRyant 9-5211

Cable Address: DIEHLWILL

## OPINION . . . . .

### Silicone Polishes

TO THE EDITOR: I should like to add my bit in praise of the new silicone-wax furniture polishes which you discussed in your March 10 issue. The best of these products stand in similar relation to the older types of polishes as the automobile does to the horse.

The ease of applying these polishes, the degree and durability of the luster obtained, the freedom from marring tendencies are truly remarkable. There is little doubt that substantially all furniture polish manufacturers will need to develop similar polishes to remain in the field and compete successfully.

As a word of caution it should be emphasized that the presence of silicone in a silicone wax polish should not be considered an unqualified indication of merit. While silicones are unquestionably an essential ingredient for superior performance there are other essential factors of composition.

The addition of silicone to a conventional wax furniture polish of the best type will almost certainly not result in a polish equivalent in excellence to some of those mentioned in your article "The New 'Sell' in Polishes."

DANIEL SCHOENHOLZ  
Research Group Director,  
Foster D. Snell, Inc.  
New York, N. Y.

### Cotton Insecticides

TO THE EDITOR: The second item in your Market Newsletter (March 10) reports Kolker's new Houston DDT plant as the only insecticide supply re-enforcement on the near horizon.

In terms of acre applications, the production of the two newest cotton insecticides, aldrin and dieldrin, now being brought in by Hyman at Denver will be by far the largest single addition to the national supply and may be the single factor which will change a critical shortage of cotton poisons to a tight supply for this season.

J. NEWTON HALL  
Vice-President  
Julius Hyman & Company  
Denver, Colo.

*CIW fumbled in the phrasing "only insecticide re-enforcement on the near horizon." However, far from overlooking Hyman, reported on Feb. 24th, that the company had set up production goals on aldrin and dieldrin of 6 million and 2 million pounds, respectively.—ED.*

### Tariff Controversy

TO THE EDITOR: If the world were at peace and if governments embraced the principles of free enterprise, the American chemical industry would have no difficulty in maintaining a strong position. We could depend on our productive resources, together with technical genius and capable management, to assure profitable operations for employees and stockholders. There would be chemicals that could be produced more economically abroad, but these imports would be offset many fold by exports of United States manufacture.

In a peaceless world, the chemical industry must be geared to peak production and must be capable of turning out all the products that would be necessary to the military and to the civilians in the event of total war. Such a condition does not mean that the industry, as a whole, will show a higher profit level than it would under free trade practices. This is a very important point that does not seem to be understood fully by the proponents of the lower tariff.

It is an anomaly that the Torquay negotiators are locked in secret session to promote trade through tariff cuts. This may be one step toward a free exchange of products in international commerce, but the representatives of a majority of the nations involved could talk about other trade restrictions. I refer to import quotas, exchange controls, domestic subsidies, commodity agreements, cartels and state trading.

Your editorial in *CHEMICAL INDUSTRIES WEEK*, March 17, 1951, states the tariff problem well. It is most important to the chemical industry that the proposed peril-point and escape clauses be made law.

WILLIAM M. RAND  
President  
Monsanto Chemical Company  
St. Louis, Mo.

TO THE EDITOR: Your excellent editorial entitled "What About Tariffs", is the most unusual and thorough analysis of the problem as we know it today. It should be given wide publicity throughout the chemical industry in particular, and all industry in general.

In our opinion this is one of the most important and serious problems facing our industry in the near future. The many reductions since the inauguration of the trade agreements program all have a far-reaching effect on



the products of chemical consumers in the United States, and the forthcoming threat of wholesale reductions in duties on chemicals as a result of the Torquay conference may cause serious curtailment in our industry.

Certainly the most important feature of the bill now before the Congress for the renewal of the Trade Agreements Act is the amendment which provides for an escape clause, making it mandatory for the Tariff Commission to investigate upon complaint by domestic producers and requiring the publication of their findings. This is the only foreseeable avenue of relief open to domestic producers of all products affected by the many trade agreements made under this program since 1934.

Your interest in publicizing this situation at this time is deeply appreciated by the chemical industry.

P. K. LAWRENCE

E. I. du Pont de Nemours & Co.  
Wilmington 98, Del.

TO THE EDITOR: . . . I have just read your editorial—"What About Tariffs" in the March 17 issue. . .

As you know, we took an active part in the hearings held by the Committee for Reciprocity Information in May and June of 1950. Our primary concern as expressed at these hearings was the wholesale manner in which tariff reductions on chemical products were being proposed. It appeared to us that there was a strong likelihood that reduction in some of the more general paragraphs of the chemical tariff would extend into many new products and even unknown products which have not yet been developed.

In so doing, we would be jeopardizing the entire future of the chemical industry in the United States. We were very much concerned about the effect that such a program might have on the national defense. We do not believe that the strategic position of the chemical industry in national defense is fully appreciated.

As you have so well pointed out in your editorial, there is a tendency to look upon the industrial role in national defense as building completed articles such as tanks and airplanes without taking into account the many operations and materials which are necessary before the finished article is completed. The role of the chemical industry in getting the job done is too often overlooked.

With reference to the renewal of the Trade Agreement Act, there is no doubt in our mind but that the peril-

point provision and the escape clause amendment are most essential to insure a fair and workable procedure for future tariff discussions with other nations.

You are to be congratulated upon your thorough and wholly readable presentation of the problem.

DONALD K. BALLMAN  
General Sales Manager  
The Dow Chemical Company  
Midland, Mich.

## Burgeoning Detergents

TO THE EDITOR: I have certainly enjoyed your very excellent article on liquid synthetic detergents (Liquid Detergent Surge, March 24). We have followed this growing market closely and, in fact, the writer pointed out this trend before the Association of American Soap and Glycerine Producers meeting early in 1950.

Incidentally, the figures from this Association quoted below show a 2½-fold growth in total synthetic detergents in the last three years, whereas liquid synthetic detergents enjoyed a 30-fold growth in the same period.

	Total Sales Year Synthetic Detergents	Total Liquid Synthetic Detergents
	Pounds	Pounds
1948	401,863,000	709,000
1949	712,456,000	10,320,000
1950	1,093,180,000	22,552,000

Actually the growth of liquid detergents in this country is somewhat behind that of foreign countries. In particular, in England, Belgium and France, liquid detergents constitute a major portion of the synthetics sold in the cleanser market.

An interesting phase of this development is the merchandising setup which involves a deposit on the bottle, much as soft drinks are sold in this country.

ARTHUR B. HERSBERGER  
Manager  
Chemical Products Section  
The Atlantic Refining Co.  
Philadelphia, Pa.

CIW's thanks to Reader Hersberger for his valued and pertinent comments. The possibility that U. S. companies may adopt the European practice of selling liquid detergents in returnable containers is well worth appraising. As CIW said (Jan. 20) "One consideration several detergent sellers have in mind: A shortage of chipboard would crimp powdered detergent sales, enhance prospects for liquids in returnable containers."—Ed.



DRUGS  
CHEMICALS  
OILS  
WAXES

COPPER SULPHATE

MONOCHLORACETIC  
ACID

MONOCHLORACETIC  
SODIUM

NAPHTHALENE

ROSENTHAL BERCOW CO., INC.

25 East 26th St., New York 10, N. Y.

CABLE ADDRESS "RODRUG"

## LITHIUM FORMS Pioneered by METALLOY...



To Aid Industry, Metalloy Has Pioneered the Manufacture of Lithium in These Forms:

### Lithium Metal

Cup . . . 1/3 lb. Shot . . . 4-8 Mesh  
Extruded Rod . . . 1/2" & 3/4" Dia. Ribbon . . . 1/4"  
Wire . . . 1/8" Dia. Cartridge (Extruded in Copper Tubing) . . . 2.25  
4.50, 9.0 & 108.0 Gram

### Lithium Hydride

Fine Ground

### Lithium Amide

Crystalline

SPECIALISTS, Metalloy has developed special forms of Lithium and Lithium Compounds for many specialized applications. Check this list of ever expanding Lithium Salts, exclusive with Metalloy:

### LITHIUM

Aluminate • Cobaltite • Manganite • Silicate  
Titanate • Zirconate • Sirconium • Silicate

AS A CONTRIBUTION TO ORGANIC RESEARCH, Metalloy's technical staff has prepared an "Annotated Bibliography on the use of Organolithium Compounds in Organic Synthesis." Annual Supplements will follow.

Let Metalloy and Lithium go to work for you today. Write Dept. A for specific data on any of the above.

IF IT'S LITHIUM — IT'S METALLOY

METALLOY CORPORATION

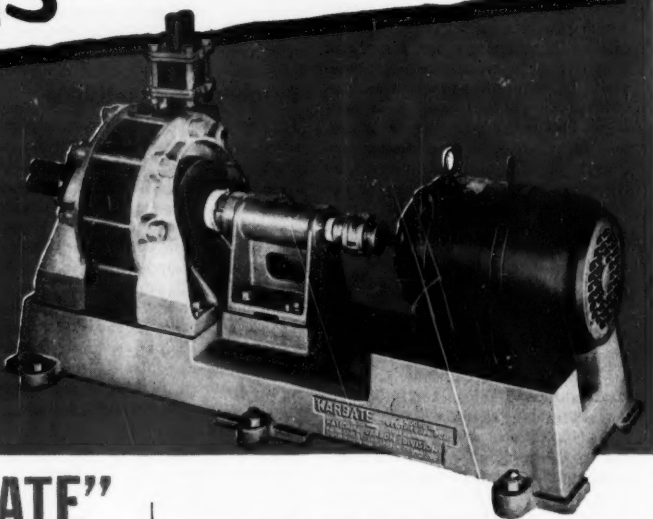
SAND TOWER MINNEAPOLIS, MINN.

OF AMERICA, INC.

# NOW SAVE 2 WAYS

not only by—**REDUCED PRICES**  
but also thru—  
**LOWER MAINTENANCE COST**

To the savings made by the reduction in "Karbate" brand impervious graphite pump prices (up to 33%), add the all-important factor of *very low annual maintenance cost*. Our records show some pumps in service for years, requiring practically no replacement parts.



Specify **"KARBATE"**  
BRAND

**Impervious Graphite  
Corrosion Resistant**

## PUMPS

HERE'S WHY—

- Case and Impeller are of "Karbate" impervious graphite—they do not corrode.
- Stainless Steel Shaft, where exposed to corrosive fluids, protected by "Karbate" impervious graphite.
- "Karbate" impervious graphite rotary seals\* are regular equipment—included in basic pump price. They are not "extras".
- No stuffing gland to require packing—a single, occasional adjustment of the "Karbate" rotary seal replaces this cost.

Other **NATIONAL CARBON** products →

\*Now, even at new low pump prices, "Karbate" rotary seals have been improved. Teflon is used to gasket the seal to the shaft and the gasket is adjusted, independently of pressure, on the seal faces.

OTHER FEATURES:

- All-purpose application
- Freedom from product contamination
- Excellent corrosion resistance
- Rugged construction
- Low maintenance—minimum servicing and replacement of parts

The term "Karbate" is a registered trade-mark of  
**NATIONAL CARBON DIVISION**  
**UNION CARBIDE AND CARBON CORPORATION**

30 East 42nd Street, New York 17, N. Y.

District Sales Offices: Atlanta, Chicago, Dallas,  
Kansas City, New York, Pittsburgh, San Francisco

In Canada: National Carbon Limited, Toronto 4

HEAT EXCHANGERS • PUMPS • VALVES • PIPING • TOWERS • TOWER PACKING • BUBBLE CAPS •  
BRICK • STRUCTURAL CARBON • SULPHURIC ACID CUTTERS • HYDROCHLORIC ACID ABSORBERS

# Chemical Industries Week

BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

## NEWSLETTER

Sparks may fly as Congress and the Defense Production Authority scrutinize rapid write-offs on new production facilities. With more than \$2½ billion investment authorized and plenty more to come, budget-minded legislators and administrators are cocking a weather eye on the voters, wondering if their acceptance of a quasi-war economy will hold out.

IG waxes being made in the U. S.? American Lignite Products Co. (Ione, Calif.) has perfected a chromate oxidation bleaching process for its montan wax, expects to be in commercial production by May. Product will be called Altco, will be turned out at about a 30,000-lb.-per-month rate. Potential market: all the big wax products makers.

Shortage begets shortage as difficulty in getting steel holds up Texas Gulf Sulphur Co.'s multimillion-dollar plant near the Spindletop Dome, Beamont, Texas. Needed to complete the foundations, the steel has been ordered since last summer but without a priority rating. The new plant was scheduled to start mining sulfur late this year, but now company officials won't predict a completion date.

Mainstay of the Japanese industrial and agricultural economy, the chemical industry has been making rapid strides during the U. S. occupation. Figures for 1950, just released, show a 25% increase in nitrate and phosphate fertilizer production over the previous year.

No end to phosphorous expansion: Even before Victor Chemical Works completes its first furnace at Silver Bow, Montana (production is expected this year), the company plans a second one at that location. This, together with a concomitant enlargement of its phosphate plants, will take Victor until late in 1952 and will add about 70% to the firm's phosphorus and phosphate chemicals capacity.

Construction of the Atomic Energy Commission's new \$45 million production plant in Colorado will get under way this month. Dow Chemical Co. will operate it for the AEC. Extent of the project is indicated by the fact that about 1,000 specialists will be needed to operate it.

Ten tons a day is the design capacity of a benzene hexachloride plant that Tennessee Frontier Chemical Corp. is building at Wichita, Kan. Operation is scheduled for August 1. Chlorine will be supplied by the closely related Frontier Chemicals of Kansas, Inc., which is building a 42-ton chlorine plant right next door. You can expect more news of the Frontier group, for officials are now weighing plans for additional chemical plants in the Wichita area.

India may ban hydroquinone imports to protect its domestic production, but the film industry is fighting the proposal, says material of Indian manufacture is unreliable in quality.

There's plenty of activity in the synthetic detergent field: Procter & Gamble is quietly modifying its Oxydol formulation, in some areas at least. Long a soap-based product, some Oxydol (notably in the Detroit sector) is now soapless, contains an alkyl aryl sulfonate as the active ingredient. Too, P & G may be preparing to launch another synthetic-based item, has just secured Prosyn as a tradename.

Fels & Co. (Philadelphia), latest major soaper to adopt synthetics, is busy test-marketing its liquid detergent, Rol, in several eastern cities.

Paintmakers may face trouble in North Carolina if a bill sponsored by the House Agricultural Committee becomes law. The proposal: No paint may be sold in the State unless it is labelled to show manufacturer, ingredients and net measure.

All manufacturers will have to be registered with the Agricultural Department and pay from one-half to one cent per gallon for inspection fees. Government agents would be empowered to enter warehouses, pick up samples for analysis, confiscate any paint in violation.

You can expect to hear more about a \$200 million, privately-financed, coal hydrogenation project which several Wall Street groups are now sizing up. As yet financial enthusiasm is not particularly high but considering the government's interest in such a development the subject is being carefully appraised.

The spotlight is on silicones. Output by the three U. S. producers (Dow-Corning, General Electric, Linde), which moved up into the thousands of tons arena in 1950, is scheduled to be boosted further this year. Increased output will be via two routes: (1) Expansion of existing facilities; (2) entrance of other concerns—now pilot-planting—into the field.

One significant criterion of industrial interest: There were only 10 U. S. patents issued on silicones prior to 1940, now there are about 400 extant.

Plans are now being drafted by Ethyl Corp. to double the capacity of its now-abuilding Houston plant. Due to come in early next year the new unit will be about a third the size of Ethyl's main Baton Rouge facilities. Planned investment in Houston over the next five years: \$44 million.

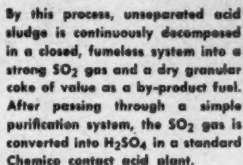
More titanium alloys are on the horizon. P. R. Mallory & Co., Inc., (Indianapolis) and Sharon Steel Corp. (Sharon, Pa.) have just formed a jointly owned company for the development and production of titanium and titanium alloys. Pilot production is now being established.

Freeport Sulphur Co. (New York) is beaver-busy seeking new sulphur deposits. Already prospecting in four locations in Louisiana and planning to build a sulphur mining unit at a fifth Louisiana dome, Freeport has just acquired rights to the Nash Dome (Texas). Exploratory drilling will begin within a few weeks.

**... The Editors**



## WITH THIS CHEMICO PROCESS



This proved and practical process offers three important advantages. (1) The purified  $\text{SO}_2$  gas provides a product acid that is free of carbon contamination. (2) The resulting  $\text{H}_2\text{SO}_4$  may be 98% or any higher strength regardless of the initial strength of the sludge. (3) Sludges that cannot be processed by other methods may be satisfactorily used in this system.

A UNIT OF AMERICAN CYANAMID COMPANY

EUROPEAN TECHNICAL REPRESENTATIVE: CYANAMID PRODUCTS, LTD., LONDON W. C. 2, ENGLAND  
CABLES: CHEMICONST, NEW YORK

EC214



**CHEMICO**  
CHEMICAL CONSTRUCTION CO.

**Chemico plants are profitable investments**

- **SODIUM BICHROMATE**
- **SODIUM CHROMATE**
- **POTASSIUM BICHROMATE**
- **SODIUM SULPHATE**

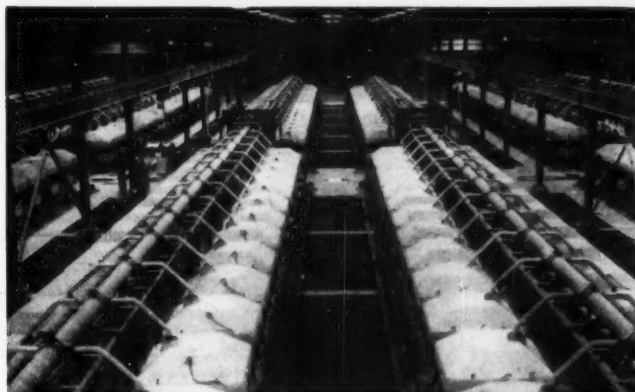


*...purity in chemicals since 1909*



**NATURAL PRODUCTS REFINING CO. JERSEY CITY 5, N.J.**

# BUSINESS & INDUSTRY . . . . .



NEW CHLORINE CELLS: Their necessity has been certified.

## More Chlorine . . . And Soon

Insatiable demand for organic chemicals based on chlorine lifts chlorine needs to a record 10,000 tons a day, while output is only some 6,200.

New units are going up week by week, and the Government has issued certificates of necessity for 3,121 tons of daily capacity at a cost of \$222 million. Another 319 tons has been applied for and is awaiting approval.

That will still leave a supply-demand gap, and the reason may well be today's high costs. New capacity must be justified by long-term sales contracts or in-plant use to assure profits.

A war economy superimposed on a booming peacetime economy will require 10,000 tons of chlorine per day by the end of 1951, according to recent government and industry estimates.

A long first step in reaching this goal was taken last week when the government issued certificates of necessity for chlorine-producing plants representing an output of 3,121 tons per day. The installations covered are granted a 5-year amortization of 50% of the \$222 million required.

It is difficult to say what percentage of the apparent need for new chlorine facilities will be met by these

new units. The 3,121-ton-per-day figure includes some plants that have been operating for some time. In addition, some certificates have been issued for improvements around existing plants. One can hardly erect any chlorine-producing capacity for less than \$500,000; and several of the certificates are for less than this figure.

**Organics the Key:** This continuing increase in demand for chlorine can be attributed almost wholly to the mad scramble to expand production of organic chemicals in which chlorine is a reaction intermediate. For example, most of the chlorine from Mathieson's plant at Saltville, Va.,

will be used for its production of ethylene oxide and glycol; Diamond's production at Houston is primarily for consumption by Shell Chemical Co.'s adjacent glycerine and ethyl chloride units; Dow's production is almost entirely for production of organic chemicals.

The paper industry is expanding its own facilities as it seeks to avert the chlorine shortages that have plagued it over the past few years.

**Cost is High:** An excellent check on the cost of new chlorine plants is provided by the dollar values for chlorine facilities at totally new locations. In general a unit, new from the ground up, costs about \$100,000 per ton-day, slightly higher for the smaller plants and even less for units to produce 200-300 tons per day. Further, those plants to be installed at existing plant locations, where the site has been partially prepared, will cost appreciably less than this figure. In some cases investment for such new capacity will run as low as \$50,000 to \$60,000 per ton day.

Because of this high capital investment for new plant, as noted earlier by CIW (*Feb. 3, p. 10*), practically all plants are being built to provide chlorine for in-plant consumption or on long-term contract to a neighboring consumer.

**Certificate No Proof:** The fact that a certificate of necessity has been issued is no proof that a plant will be built. It merely gives the company the right to a 5-year amortization for 50% of the capital investment, if it does build the proposed unit. But industry sources indicate that about 2% of certified capacity is under way.

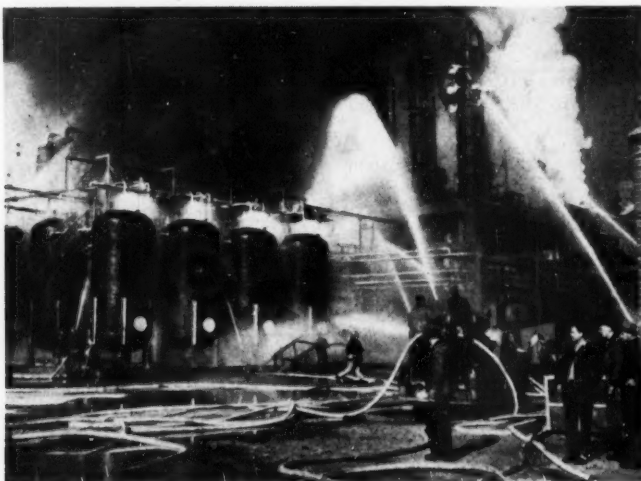
### CHLORINE BOX SCORE

	Tons/Day
Estimated Needs, End of 1951	10,000
Rated Capacity 1/1/51	5890
Production 12/50	6,213
<b>Apparent Need</b>	<b>3,787</b>
Chemical Corps. plant, Muscle Shoals, Ala.	180
<b>Need</b>	<b>3,607</b>
Certificates of Necessity Requested	3,440
Certificates of Necessity Granted	3,121
Certificates of Necessity Under Study	319

COMPANY	LOCATION	Chlorine Tons/Day	Cost M Dollars
Brown Co.	Berlin, N. H.	14	\$ 221
Columbia Chemical Div. Pittsburgh Plate Glass Co.	Natrum, W. Va.	124	10,200
Diamond Alkali Co.	Painesville, Ohio	40	2,183
Diamond Alkali Co.	Houston, Texas	180	10,877
Diamond Alkali Co.	Houston, Texas	40	
Diamond Alkali Co.	Houston, Texas	60	
Dow Chemical Co.	Pittsburg, Calif.	77	2,939
Dow Chemical Co.	Midland, Mich.	100	2,600
Dow Chemical Co.	Freeport, Texas	160	37,760
Dow Chemical Co.	Freeport, Texas	480	
Frontier Chemical Co.	Wichita, Kans.	40	1,468
Hooker Electrochemical Co.	Niagara Falls, N. Y.	35	688
Innis, Speiden & Co.	Niagara Falls, N. Y.	5	830
Mathieson-Alabama Chemical Corp.	McIntosh, Ala.	100	8,125
Mathieson Hydrocarbon Chemical Corp.	Saltville, Va.	180	9,150
Michigan Chemical Co.	St. Louis, Mich.	84	9,960
Monsanto Chemical Co.	St. Louis, Ill.	28	1,450
National Distillers Chemical Corp.	Ashtabula, Ohio	175 (a)	28,856
Niagara Alkali Co.	Niagara Falls, N. Y.	22	1,045
N. Carolina Pulp & Paper Co.	Roanoke Rapids, N. C.	11	1,500
Pennsylvania Salt Mfg. Co.	Wyandotte, Mich.	49	1,381
Pennsylvania Salt Mfg. Co.	Tacoma, Wash.	25	445
Pennsylvania Salt Mfg. Co.	Calvert, Ky.	100	6,500
Pennsylvania Salt Mfg. Co.	Portland, Ore.	6	1,497
Solvay Process Div., Allied Chemical & Dye Corp.	Hopewell, Va.	28	2,150
Solvay Process Div., Allied Chemical & Dye Co.	Moundsville, W. Va.	330	29,200
Southern Alkali Co.	Lake Charles, La.	163	10,080
Southern Alkali Co.	Corpus Christi, Texas	120	8,666
Southern Ferro-Alloys Co. (Tennessee Products)	Chattanooga, Tenn.	50	3,250
Stauffer Chemical Co.	Niagara Falls, N. Y.	75	5,155
Wyandotte Chemicals Corp.	Wyandotte, Mich.	200	23,332
Wyandotte Chemicals Corp.	Wyandotte, Mich.	20	
<b>Total</b>		<b>3121</b>	<b>\$221,508</b>

(a) Metallic Sodium.

## Rubber Cutback Blamed On Blaze



NPA SLASH ON CIVILIAN USE OF RUBBER is reported to be the result of the fire at Kopper's Kobuta butadiene plant. Blaze, involving an estimated \$500,000 in damages, is expected to reduce GR-S production in March and April by 7000 tons. NPA's action was not as drastic as anticipated, however. The order, issued this week and effective April 1, reduced civilian consumption of new rubber 1,500 tons below March levels, also banned spare tires on new cars.

## Delaney Round 2

The Congressional committee investigating the role of chemicals in food products will resume hearings next week. Purpose: to determine whether present laws afford proper control, and if not, how they should be modified or extended.

The original Select Committee, chair-manned by Representative James J. Delaney (Dem., N. Y.) died with the old Congress. That committee concluded, after its hearings last fall, that additional legislation was probably necessary, but affected groups and individuals should have a further chance to make their views plain.

The new House re-created the committee, still with Delaney at its head, and gave it an appropriation of \$75,000 to continue hearings. Officials of the U. S. Department of Agriculture are the first to be heard, on April 12, 13 and 17. They will testify on the role of chemicals as food additives, in food processing, in pesticides and fertilizers, and in maintenance of food processing equipment.

## DDT Eyes Too Big

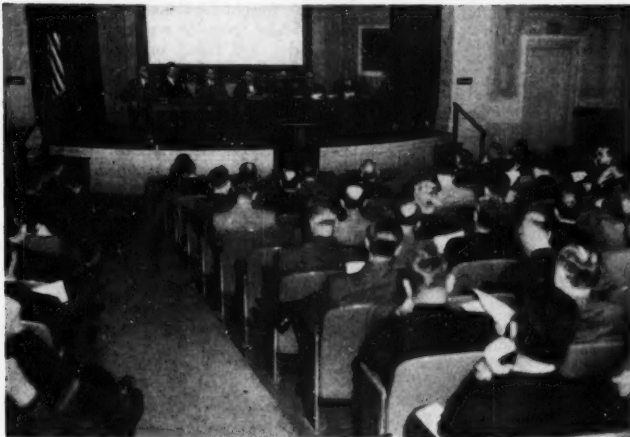
DDT makers in effect have just told National Production Officials that the military agencies have scared the NPA into allocating them more than they can bite off and chew. They have asked NPA to modify its order requiring manufacturers to accept up to 25% of monthly production in defense rated (DO) orders.

The DDT Industry Advisory Committee wants the figure cut to 20% of monthly production for the second quarter to enable manufacturers who have filled May DO orders to supply more DDT for essential civilian needs. It also is pressing to have NPA pare export requirements for the same period to take care of seasonal demands of agriculture during these three months.

**A Record, But:** January production of DDT was 7.6 million lb—an all-time high—but the industry states that there is not enough benzene, sulfuric acid or chlorine to meet anticipated DDT production demands in the future. NPA officials say that ECA demands for typhus control and other health measures, for example, will use up about five million lbs this year.

To help the DDT manufacturers, NPA will shortly put sulfuric acid under allocation. But benzene and chlorine will continue to be short for about a year.





**PROCUREMENT PANEL:** On the dais, government experts; in the orchestra, confused businessmen.

## Experts Explain Contract Anomaly

"Middle-men" contractors are getting big slice of prime government defense contracts.

Their ability to assume financial responsibility is reason given by government experts for the practice.

Defense procurement officials tell businessmen "facts of life" regarding purchasing setup and negotiation.

The "middle-man" contractor, who owns neither plant nor equipment and who is usually sans employees, is getting a fat share of government contracts on both bid and negotiated bases. This fact was freely admitted by a panel of government procurement experts to a recent gathering of 300 business men in Washington recently.

At the meeting, which was held at the American University, the manufacturers brought up their age old charge that middle-man contractors usually farm out the contract to one or more firms and take a "cut" for the mere "handling." By so doing, the manufacturers argued, middle men contribute nothing that could not have been done by the sub-contractors who actually perform the work.

This charge against middle men has been an old gripe of chemical manufacturers who time after time have seen "operators" who run no production operations grab off the cream of government awards.

Money a "Must": But the government men explained that under the "spreading of the base" theory, by

which they must operate, financial responsibility is the determining factor in awarding contracts. The government requires only financial protection in case of default. And since the middle-men are usually well financed . . . they're getting a lot of the business.

This was one of the rough "facts of life" that was given the businessmen who came from all parts of the country to attend the Institute on Armed Forces Procurement to learn why they had difficulty in securing government defense contracts. Each present paid \$25 to the American University who sponsored the Institute in cooperation with the National Association of Manufacturers and the Munitions Board. Some got answers and others learned more about the sometimes difficult methods of doing business with Uncle Sam.

**Questions:** The question points raised by the businessmen fell into a pattern that could be neatly grouped under five heads: (1) lack of information on what agency buys specific items and where, (2) how a small businessman can get a prime contract, (3)

where to get information on prime contracts so a businessman can go after a subcontract, (4) how to get by under controls which take away raw materials before firm gets a military contract, and (5) how negotiation is carried on.

**Answers 1 & 2:** In answer to the first type of question, the Armed Forces' experts pointed to their "How To Sell" booklets, all three of which were recently revised. The answer to the second question was a little gloomy to the businessmen, however. The experts explained that the government cannot easily break up the large contracts into smaller ones so that more businessmen can participate. In many cases, they added, only the large firms are capable of assuming the responsibility.

**Answers 3 & 4:** The procurement officers admitted that there is no central place where a sub-contractor can find out what contracts have been let and to whom. The commerce department's weekly synopsis of contract awards (which must be picked up in person at the department's field offices) lists some such information. But it is inadequate since it does not include the many classified contracts.

**Answer 5:** Complaints and queries about contract negotiation regulations dominated the whole question and answer session. Businessmen complained that the present regulations are vague and ambiguous. The experts replied that the lack of ground rules for negotiation does not mean that there is anything "undercover" about this form of buying. They claimed that competition has not been totally removed from the scene because a number of possible suppliers are approached to submit original bids. It is from these that the government selects several for negotiating. Bible for negotiation is the Armed Forces Procurement Regulations (ASPR). But the trouble remains that the ASPR only outlines the circumstances permitting negotiation and discusses policy in general terms.

**Town Meeting:** The Procurement Institute, brainchild of American University's active president, Paul F. Douglass, was master-minded by Emil K. Kubin. The latter, a Washington Administrative lawyer, was able to round up 40 government purchasing officers and eight businessmen to come to the General Services Administration auditorium and sit on the panels.

More than 90 percent of the enrollees were from out of town. But there was a liberal sprinkling of Washington representatives of large firms . . . and a few five percenters.



**BUSINESSMAN'S QUESTION:** He had five problems on his mind.

**Panel Personnel:** The panel on "Financial Aids" included Major General E. M. Foster, Chief of Finance, U.S. Army, and Air Force and Navy contracting chiefs as well. The "Renegotiation" panel included Frank L. Roberts, Chief of Military Renegotiation Policy and Review Board, Defense Department, The "Sub-contracting" panel included Henry E. Hansen, Director of the NAM's Economic Policy Division, now on temporary duty with the Munitions Board.

**Theory meets practice:** All told, the get-together provided a good meeting ground for the theory and practice of how to go about getting government contracts. Though many of the attendees left still slightly confused about the whole thing most felt that the show was worth the price of admission.

## Whose Oil Is It?

Senate Joint Resolution 20 is another high point in the dispute over whether congress should convey to the coastal states the lands of the continental shelf and the minerals contained. Aimed at clarifying the issue it is merely adding fuel to the fire.

If the country is to hit its goal of an additional million lbs. of oil daily, the petroleum industry says that a prompt settlement of the tidelands dispute is necessary (CIW February 24). And the industry is anxiously awaiting congressional action on a senate joint resolution.

**SJR 20:** The resolution, introduced early this year by Senator O'Mahoney, was referred to his Committee on Interior and Insular Affairs. It seeks

continued operation under mineral leases granted by the states and suspended by the Supreme Court. The resolution would also permit resumption of drilling as an "interim" measure until permanent legislation could be written.

Prior to 1933, no one disputed the states ownership of the continental shelf and minerals it contains. But Harold Ickes (then Secretary of State) reversed the department's policy of refusing leases on the grounds that the state owned the shelf. Three Supreme Court decisions since then have found in favor of the government ownership, although the decisions have done little toward clarifying the picture.

Recent hearings on the senate resolution were the scene of some pointed debates. Lined up solidly against it were Ickes and former senator, Burton Wheeler.

Wheeler calls the action of the oil companies in attacking the Supreme Court decision "vicious." He says that Interior is "commanded" under the Minerals Leasing Act of 1920 to issue prospecting permits to those who applied before a 1935 amendment became effective. There are 16 such prospectors—and Wheeler is the attorney for 11 of them.

Opposing Wheeler are three oil companies—Signal Oil & Gas, Southwest Exploration Co. and the Long Beach Development Co. The first two firms hold state leases granted before the Supreme Court decided in favor of government ownership.

Attorneys for the oil companies contend that the government has not lost a penny as a result of the operations of the two firms. Their basis is that leases provide that money received is to be held in escrow pending final decision by the courts or congress.

Ickes said of the subject, "this whole thing has been as obscure and messed up public issue as anything with which I have ever had any connection." He calls the present leasees trespassers. An interesting point in connection with Ickes' testimony is that the trespassers are the "big" companies that Ickes has battled all his life.

**Other Bills:** Congressman Walters (D. of Pa.) would also give the states ownership of the shelf. His is a "quit-claim" bill to give the states full



**ICKES AND WHEELER:** Tidelands dispute slows oil output.

*Announcing*

**A NEW KOLKER PLANT  
IN HOUSTON, TEXAS  
FOR THE PRODUCTION OF**

**DDT**

*To* HELP MEET the tremendous demands of agriculture, the military and public health, Kolker has just completed this new DDT unit in Houston — the only DDT plant in the Southwest.

STRATEGICALLY LOCATED near rail, truck and ship terminals, the new plant — our second — is now in production. This, together with our recently completed BHC plant in Houston now offer better service and faster deliveries to southern and western markets.



Kolker DDT meets the same high standards that characterize all Kolker chemicals.

**DDT • BHC • 2,4-D • 2,4,5-T**



**K**

**KOLKER CHEMICAL WORKS INC.**

80 CISTED AVENUE, NEWARK 5, N. J.

*Manufacturers of Agricultural Chemicals*



*The Standard  
of Quality*



**TRIANGLE BRAND**

**COPPER  
SULPHATE**

**99+% PURE**

ALSO

*Nickel Sulphate*

*Selenium*

*Tellurium*

**PHELPS DODGE REFINING CORP.**

*Electrolytic Refiners of Copper*  
40 Wall Street, New York 5, N. Y.  
230 N. Michigan Avenue, Chicago 1, Ill.



## BUSINESS & INDUSTRY . . . . .

rights in the 3-mile zone and 37½% of royalties from the remainder of the continental shelf lying in front of their coastal areas. Senator Knowland

(R. of California) wants his S. 940 Bill substituted for SJR 20. He calls the resolution inadequate, says congress can and should act.



QUESTION BEFORE THE BOARD: Is debt financing the answer?

### Spotlight On Bonds

Recent recapitalizations by Victor Chemical and Celanese Corp. could indicate a trend in astute chemical financing. Huge expansion programs mean that outside capital is inevitable. And the undisputed merits of gaining it through new stock issues are partially offset by provisions of the federal excess profits tax and low interest rates on bonds and notes. Traditionally reluctant toward gaining new capital through increasing their funded debt, chemical companies may find that method increasingly attractive. Some financial wizards point to recent recapitalizations (Victor Chemical, Celanese), and come up with a significant conclusion: It may be a trend toward debt financing.

As in previous years, the chemical industry will finance the bulk of its expansion in 1951 through depreciation reserves and retained profits (91%). But unprecedented, \$2.14 billion expansion plans mean that it will have to rely more heavily on outside capital, particularly notes and bonds.

**Debt Financing:** To finance its expansion program, which will involve an outlay just about double the original estimate, Victor needed \$9 million additional capital. Last week,

the company disclosed that it would obtain \$5 million from a new issue of preferred stock. And the remaining \$4 million would come from the sale of 20 year sinking fund notes.

Celanese has recently undergone a thorough revamping of its financial structure. The company has filed with the Security and Exchange Commission a registration covering \$100 million principal amount of sinking fund debenture (25 year) and \$100 million of preferred stock. The new debenture will be used to consolidate present debts, will also net the corporation \$24 million in new funds.

**Pro and Con:** With federal income and excess profits tax taking more than half of industry's pretax income, more weight is being given to the advantage of debt financing. Although an EPT credit is allowed for any new capital, interest on bonds and notes are deductible; dividends are not.

Another factor that makes funded debt seem attractive is the U.S. Treasury's policy on interest rates (though modified slightly by the recent agreement with the Federal Reserve Board). As the country's biggest borrower, the government is determined to keep interest rates down. Through its effect on the banking system, this policy makes money easier for other

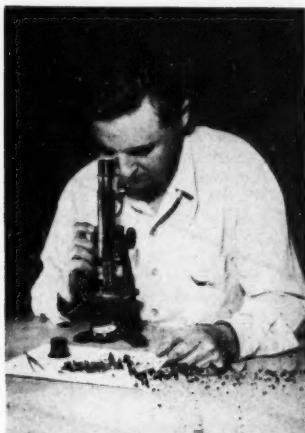


## BUSINESS & INDUSTRY . . . . .

borrowers, too. Major chemical firms of course qualify as prime risks.

One of the reasons financial circles had hoped that companies would be in a position to sell equity instead of debt securities is the buoyancy of stock prices in recent months. Standards and Poor's chemical stock index, for instance, stands at 200—twice the 1939 level. This would enable the industry to get new equity on more favorable terms.

In any event, chemical expansion will be financed from inside sources for some time. Experts merely think Celanese and Victor made shrewd moves in foregoing complete outside money through new stock and raising their funded debts.



CARROLL F. CHATHAM: An emerald in 7 months, under carefully controlled conditions.

### Home-Grown Emeralds

Synthesis of precious emeralds up to 600 carats in size is a fast-moving business for Chatham Research Laboratory. Only three years old, the one-man enterprise now has a \$100,000 order backlog, mostly from jewelers. Since the day he first made an emerald in his basement laboratory, Carroll F. Chatham has been turning his special talent to hard cash. Despite healthy commercial acceptance of his gems, he is now hard at work perfecting production techniques, boosting output.

Although he has been in commercial operation since 1948 in a small establishment on an East Side street in San Francisco, Chatham has now improved his process radically to get increased over-all yields. He is con-

centrating at present on means to increase the proportion of clear crystals (now about 5%) in the total output, and thinks he is now on the right trail.

He is now able to grow crystals of much larger size than the 200 carat previous maximum. Clear (finest) crystals up to six carats occasionally are obtainable, and the size limit isn't yet known. In the lowest (opaque) grade, Chatham can produce 600 carat growths, larger if need be. Any relationship between size and quality is not established so far.

**Demand is High:** Today his production of emeralds of all grades from clear to totally opaque is at the rate of around 5,000 carats per month. Despite this, his backlog of orders is over \$100,000. Virtually all the output goes into jewels. Chatham says India alone would take his entire production.

Chatham has virtually a one-man monopoly in introducing new first-grade emeralds into the markets of the world. This is because the rate of discovery of natural first-grade stones is very low. The laboratory gems are retailed as "Chatham emeralds," sell for around \$120 per carat as opposed to \$700 to \$1,000 for the natural product.

The synthetics are structurally and chemically indistinguishable from natural emeralds. The process for making them—it takes about seven months to "grow" a batch—is known only to the inventor, who has not patented the method for obvious reasons. Raw materials consist of highly purified alumina, beryllia and silica, with small quantities of chromium and iron oxides added to produce the desired color. Combination of these materials under carefully controlled conditions produces the final product, a complex beryllium aluminum silicate. Chatham has little fear that his secret could be learned either by observation of his work or examination of his equipment.

**Many have tried:** Several American companies have tried to make emeralds but with no commercial success. In 1930 I. G. Farbenindustrie in Germany announced synthetic emeralds, but according to Chatham the product was entirely of inferior quality and was not made after 1938.

Encouraged by his success in developing the world's first and thus far only commercial process for synthesizing emeralds, Chatham is now investigating an equally challenging problem: synthesizing diamonds. "I have had no luck so far," he says, "but I may if I live to be 80."



Fix things quickly by installing  
**TUF-TRED**  
**SAFETY MATTING**



Quiet and comfortable to walk on. Retards fatigue. Reduces breakage. A highly popular, low priced, superior grade of rubber fabric matting and the only one equipped with non-trip beveled safety nosing on the ends. Links strongly laced on galvanized, rust-resisting steel wire, reinforced by metal plates. Thickness 5/8". Width: up to 6 feet. Any length.

Consult your telephone directory for American Mat office or write us direct.

**WANTED! Distributors and direct factory representatives!**

### AMERICAN MAT CORPORATION

"America's Largest Matting Specialists"

1797 Adams Street Toledo 2, Ohio

( ) Please send prices on Tuf-Tred Superior Grade Corded Rubber Fabric Link Matting.

( ) Please send information on Ezy-Rug Rubber Link Matting; ( ) American Counter-Tred Safety Matting; ( ) Traffic-Tred Matting; ( ) Do-All All-Purpose Rubber and Cord Matting; ( ) Vinyl plastic Link Matting.

NAME .....

FIRM .....

STREET .....

CITY & STATE .....

IN CANADA

OFFICES: American Mat Corporation, Ltd.  
Canada Trust Building, Windsor, Ontario

FACTORY: West Lorne, Ontario

# EASTMAN INDUSTRIAL CHEMICALS

## ANHYDRIDES

(Aliphatic)

EASTMAN ACETIC ANHYDRIDE  $(CH_3CO)_2O$   
Acetylating Agent  
Dehydrating agent in nitration and sulfonation reactions, etc.

## ACIDS

(Olefinic)

EASTMAN CROTONIC ACID  $CH_3CH=CHCOOH$   
A reactive chemical for the preparation of derivatives useful as plasticizers, polymers and copolymers, flavorings, perfumes and chemical intermediates

## ACIDS

(Aliphatic)

EASTMAN BUTYRIC ACID  $C_3H_7COOH$   
For the preparation of butyric esters useful in formulating perfumes and flavorings

## ACIDS

(Aliphatic)

EASTMAN ACETIC ACID  $CH_3COOH$   
Organic Synthesis  
Reaction medium and solvent  
Dyeing assistant

### SALES REPRESENTATIVES:

New York—10 E. 40 St.;  
Cleveland—Terminal Tower  
Bldg.; Chicago—360 N.  
Michigan Ave.

### WEST COAST:

Wilson & Geo. Meyer & Co.

San Francisco—333 Montgomery  
St.; Los Angeles—4800 District  
Blvd.; Portland—520 S.W. Sixth  
Ave.; Seattle—1020 Fourth Ave. So.

TENNESSEE EASTMAN COMPANY

(Division of Eastman Kodak Company)

KINGSPORT, TENNESSEE



## EXPANSION. . . . .

**Air Reduction Co.:** A \$10 million calcium carbide plant will be built at Calvert City (near Paducah), Ky. Company says the plant (to be operated by National Carbide), with an initial rated capacity of 142,500 tons per year, will be about the same size as the present one at Louisville.

Most of the initial production will be shipped outside of Calvert City. However, the plant will occupy only part of a 1,000-acre site; the remainder will be held in reserve to accommodate industries that may locate there to produce acetylene-based synthetics.

Present schedule calls for construction to get underway July 1, operation of the first furnace to begin by January 1, 1953, and the second by March 1, 1953.

**Westvaco:** Food and Machinery Corp. plans to expand soda ash production of its Westvaco Chemical Division at Westvaco, Wyo. The company plans to transfer the mining and soda ash operation, together with about \$4.5 million in cash, to a subsidiary to be formed for the purpose. It is intended that the subsidiary will sell 20% of its capital stock to National Distillers for \$2 million.

Current plans call for construction of soda ash refining facilities to start in 1951, which will have an annual capacity of 300,000 tons.

The new subsidiary will spend \$11.6 million on the new facilities and will invest \$2,725,000 on mine development work.

**Monsanto:** The company has purchased the Addyston (Ohio) plant of United States Pipe and Foundry Co. The newly-acquired facilities will be used to produce styrene and phenolic resins. The plant is part of the \$20 million plastics expansion program, previously disclosed by Monsanto. Officials expect production to begin early in 1952.

## PEOPLE. . . . .

**Clarke W. Davis,** assistant general manager of Du Pont's Grasselli Chemical Department since 1942, will head up Rubber, Chemicals, and Drugs Division of the Office of Price Stabilization.

**Carroll S. Anderson,** recently in charge of expansion of Du Pont's nylon yarn plant at Chattanooga, will be field project manager to supervise construction of the Dacron (formerly Fiber V and Amilar) plant at Kinston,

N.C. Anderson will assume his new duties early this month.

**William R. Dixon** will be the new assistant general sales manager for Dow. As assistant general of the plastics sales division since 1941, he has played an important role in the organization and direction of the company's extensive plastics merchandising program.

**D. R. Mehl** is the new divisional purchasing agent for the Chemical Plants Division, Blaw-Knox. In other moves there, Harry J. Lyle will move up to assistant division purchasing agent, and R. F. Keenan to head buyer.

**William E. Harvey** will shortly assume duties as vice president in charge of carbon and graphite products for Speer Carbon Company.

## FOREIGN. . . . .

**Austria:** The first post war production of sulfuric acid will get underway this month, when the new plant in Carinthia is completed. The company, Bleiberger Bergwerks-Union, estimates initial production will be at a rate of 15,000 tons a year, expects to double the rate by fall.

Most of the country's sulfuric plants were destroyed during the war; the rest were dismantled immediately after the war. As a consequence the country has had to import 80,000 tons a year.

**Greece:** The Greek Ministry of Trade has recently issued its new import program for certain pharmaceuticals and chemicals for the period ending June 30, 1951.

Imports of penicillin, through private exchange, will amount to \$50,000 from the dollar area and \$20,000 from the European Payments Union. Other imports on the new schedule: streptomycin (\$100,000 from dollar area and \$100,000 from the EPU); aureomycin (\$45,000 from the dollar area only); chloromycetin (\$15,000 from dollar area and \$30,000 from EPU); quinine tablets (\$50,000 from EPU only); and blood plasma (\$10,000 from the dollar area and \$10,000 from EPU).

Raw materials from the chemical industries on the schedule are restricted to \$250,000 from the dollar area and \$300,000 from EPU. The Ministry of trade is issuing licenses for the import of caustic soda—reportedly \$100,000 is available for the material.

## PRINCO'S NEW A.S.T.M. LABORATORY THERMOMETER SETS



Cat. #0260 C  
0260 F

● Nine certified extreme precision laboratory thermometers (ASTM Spec.) cover the interval between  $-38^{\circ}\text{C}$  and  $+405^{\circ}\text{C}$ , ( $-36^{\circ}\text{F}$  to  $+760^{\circ}\text{F}$ ) Mercury-in-glass with finely divided scales and plush lined carrying case. These new thermometers are offered by PRINCO as part of the complete listing of ASTM spec. thermometers. Special folder issued on request.



Cat. #76  
or 77

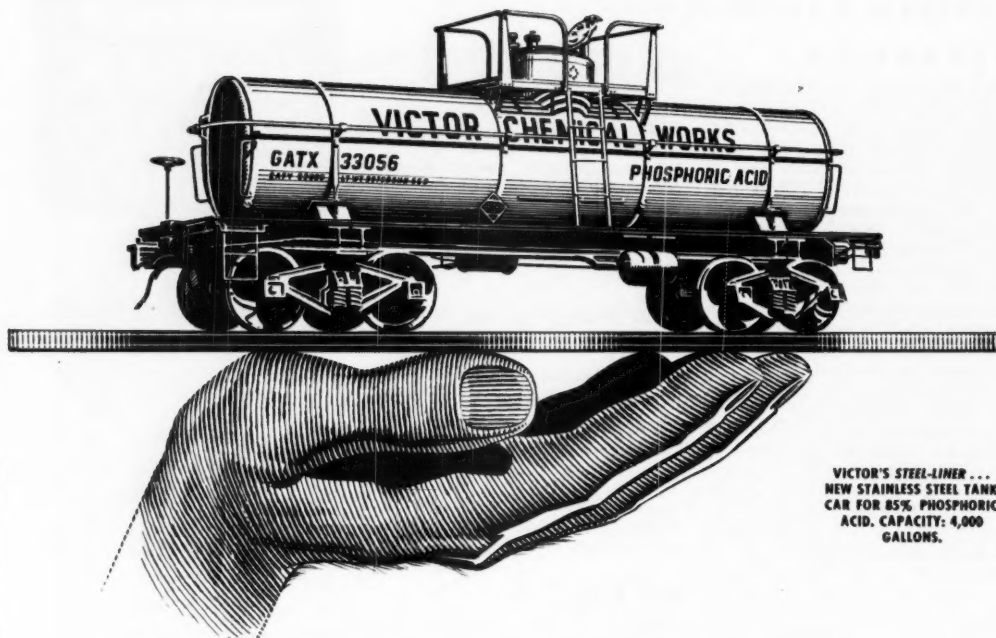
● These "PRECISION SPECIAL" Thermometer Sets have long been used as a laboratory standard. Six thermometers in case cover interval between . . .  
 $-60^{\circ}\text{C}$  or  $-38^{\circ}\text{C}$  and  $+360^{\circ}\text{C}$   
( $-76^{\circ}\text{F}$  or  $-36^{\circ}\text{F}$  to  $+680^{\circ}\text{F}$ ).

Write for Bulletin "C".

**PRECISION**  
THERMOMETER COMPANY  
**PRINCO**

PRECISION INSTRUMENTS FOR INDUSTRY

1449 BRANDYWINE STREET  
PHILADELPHIA 30, PENNA.  
In Canada: Peacock Bros. Limited



VICTOR'S STEEL-LINER ...  
NEW STAINLESS STEEL TANK  
CAR FOR 85% PHOSPHORIC  
ACID. CAPACITY: 4,000  
GALLONS.

# with emphasis on service...

## PHOSPHORIC ACID USES:

### Manufacture of:

yeast, sugar, soft drinks,  
imitation jellies, gelatin,  
pharmaceuticals

Rustproofing, engraving,  
railroad car cleaning,  
refining oil and gasoline,  
preserving silage

Weighting silk, dyeing textiles

Chemical polishing and electro-  
polishing metals, bright-dip  
baths for aluminum

### Manufacture of

phosphates, dental cements, glue,  
ceramics, glass, metal treating  
compounds, explosives, fertilizers

## Containers for Victor Phosphoric Acid:

TANK CARS,

55 GAL. STAINLESS STEEL DRUMS,

13 GAL. GLASS CARBOYS.



New uses for phosphoric acid are continuously being developed. Some of these new applications require tank car quantities of this important, versatile material.

To provide carload service for 85% acid customers, Victor has introduced a new stainless steel tank car which is specially equipped with steam heating coils. Shipping 85% phosphoric acid in the usual rubber lined tank cars is not advisable. Users of tank car quantities of Victor 85% phosphoric acid find it easier and more convenient to unload the material from the Steel-Liner.

The Steel-Liner is another example of the importance Victor places on SERVICE. As always, Victor's technical and research scientists are searching for ways to improve and develop chemicals and services to industry. If you have a product problem, contact Victor! Your inquiry should prove profitable to you!



## VICTOR CHEMICAL WORKS

141 West Jackson Boulevard • Chicago 4, Illinois

A. R. Maas Chemical Co., Division • 4570 Ardine St., South Gate, California



# RESEARCH . . . . .



FEEDING EXPERIMENTAL CHICKS: New item on the menu.

## "Wonder Drugs" Snag New Laurels

Lucrative livestock market is latest research dividend for antibiotic producers.

Four wonder drugs are highly effective in promoting growth of poultry and hogs.

How they do it is one of the questions that still perplex researchers.

**Antibiotic feed supplements**, commercially non-existent a scant year ago, are today a multi-million dollar business. Major credit for this phenomenal development rightfully belongs to the score of industrial and academic researchers who have climbed the ladder of experimental evidence—step by step—to its present profitable rung. Interest created by their work has been tremendous and the resultant demand is ample proof. Conservative estimates place the value of antibiotic feed supplements at about \$30 million for the coming year.

Popularity of the new products is a direct result of the dollar and cents—benefits they offer to livestock producers. Feed supplements of this type are intended for one purpose: to increase feed efficiency. They do this by making more ingested food available for meat production than would be possible without their use. Or to put it another way, a given amount of food will cause a greater increase in weight, if an antibiotic is included.

Result is a distinct saving in feed, for obviously less feed will be required in supplemented diets to give the same nutritional effect as the unsupplemented.

**Growth Acceleration:** On the other hand, if feed allotments are kept constant in both supplemented and unsupplemented diets, a striking growth-acceleration is noted. Animals receiving the antibiotic gain weight up to 15%\* faster than their deprived fellows. Maturity is hastened and marketable weight is reached on proportionately less feed. Savings are substantial, and will in turn be transferred to the ultimate consumer.

Feed supplements date back to 1938 and Commercial Solvents Corp.'s riboflavin. A member of vitamin B group, riboflavin has undisputed nutritional value. The antibiotic supplements are related in name only and function on an entirely different basis. Their beginnings are more accurately

\* Depending upon the antibiotic, and type of animal.

traceable to the end of the last decade and the now obsolete APF (animal protein factor) fermentation products. For a time, it was believed that the growth stimulating effect of APF was due entirely to vitamin B<sub>12</sub>—a normal component of antibiotic fermentation tailings. But often APF produced a growth stimulation over and above that which could be attributed to B<sub>12</sub>. The riddle was answered early in 1950 with the discovery that antibiotics in APF were responsible.

**Mechanism Obscure:** Antibiotics—unlike vitamin supplements—are valueless as nutrients. Mechanism of their growth-promoting effect is still obscure, but apparently tied to germicidal activity. One theory states that the antibiotic, by killing off bacteria which compete with it for food, alters the intestinal flora in a way which enables the organism to make the most of food entering the intestine. Another idea is that antibiotics adjust the microbial population so that certain vitamin and nutrient producing bacteria find it easier to carry on their beneficial function.

Whatever the precise mechanism, experimental evidence indicates the activity of certain nutritional factors is clearly enhanced by antibiotic supplementation. Vitamin B<sub>12</sub> is the best example, although the phenomenon appears to apply to proteins as well.

Selectivity of specie is an interesting feature of antibiotic action. Swine and poultry derive the most benefit, while other species of mammal are affected adversely more often than not. Greatest growth stimulation occurs during early life and gradually levels off with approaching maturity. For this reason, evaluation of growth stimulation (by antibiotic supplements) in very young subjects has little practical meaning to the livestock grower. Moreover when subjects are very young, the small weight-increase produced by the supplement shows up as a large percentage. Comparison at average market age is the true test.

**Teaspoon to a Ton:** Four antibiotics now have a corner on the supplement market: aureomycin, bacitracin, penicillin-procaine, and terramycin. Streptomycin provided the original research clue to the entire development, but its comparatively low effectiveness is a block to commercial exploitation.

Feed supplement antibiotics, with the exception of penicillin-procaine, do not compare in purity to their therapeutic counterparts. Cost averages about 15¢ a gram, and ten grams is usually adequate for a ton of

feed. When the total cost of antibiotic in a ton of feed is divided by the number of chickens that it suffices the resulting figure explains a great deal of the antibiotics' success.

Relative effectiveness of the various antibiotics is still largely an unsettled question. Recent tests at Storrs Agricultural Experiment Station of the University of Connecticut's College of Agriculture have produced some interesting data. Of the 5 substances investigated (aureomycin, bacitracin, penicillin-procaine, streptomycin, and terramycin), streptomycin was least effective.

**Quality Counts:** Antibiotics produced greatest per centage growth response with poor quality all plant-protein rations; greatest total weight with better quality, plant protein plus fish meal rations. Bacitracin and penicillin-procaine-supplemented fish meal rations maintained an increased growth response for a longer period of time than the other antibiotics. Slower absorption due to higher molecular weight has been advanced as one explanation for this observation.

Bacitracin appears to be superior in some cases, but (excluding streptomycin) the relative differences are small. However the data as a whole indicates that the better the nutritional quality of the ration, the less growth response evoked by antibiotic supplementation.

**Big Four:** Four antibiotics rule the barnyard market. Bacitracin goes into Commercial Solvents Corp.'s Baciferm supplement and also gets the nod from U. S. Industrial Chemicals. Merck & Co. puts its faith in penicillin-procaine while Lederle Laboratories' Aurofac supplement contains aureomycin. Chas. Pfizer & Co. goes along with terramycin for its Bi-Con-TM-5. Several of these products incorporate vitamin B<sub>12</sub>, but there seems to be a growing tendency to divorce it from the antibiotics and market the vitamin on a separate basis.

Logic for this move stems from the greater flexibility it would allow feed formulators. Feeds vary in nutritional value from area to area. Many are adequate in B<sub>12</sub>; supplementary amounts would serve no purpose but to increase cost. Availability of independent sources of antibiotic and vitamin permits most economic formulation of feeds to individual specifications for optimum efficiency.

This, in effect, is the guiding principle of feed supplementation—manipulation of cost factors (proteins, vitamins, antibiotics, etc.) to produce the most meat for the least money.

**New Rules:** Even if vitamin B<sub>12</sub>

is not intentionally added, most crude antibiotics used in supplements will contain some B<sub>12</sub> carried over from fermentation processes. This raises the question of differentiating between an antibiotic supplement and a B<sub>12</sub> supplement. Fortunately, regulations drawn up by the Association of American Feed Control Officials in collaboration with the U. S. Food and Drug Administration, take the guesswork out of this task.

Rules which took effect the first of this year define a vitamin B<sub>12</sub> supplement as one which contains a minimum of 1.5 mg. of B<sub>12</sub> activity per pound. Antibiotic products must contain a minimum of 1 gram per pound. Label, in the case of B<sub>12</sub> must declare the number of milligrams of activity; antibiotic product labels must bear the name and quantity of antibiotic and the legend—"For nutritional use only."

Although the youthful antibiotic feed supplements already are big business, basic research has only scratched the surface. Mechanism of action, specie specificity, effect on dietary factors, comparative efficiency, and long-term effect, are only a few of the indicated paths of investigation. But, if commercial success is any gauge, the wonder drugs are really living up to their reputation.

## Octane Gain

**Addition of small amounts of boron compounds to leaded gasoline reduces octane requirements for knock-free operation. This new development allows cuts of as much as 20 octane points. That's the next conclusion of a research project headed up by Everett C. Hughes, Standard Oil of Ohio's research director.**

Although the boron anti-knock additives have successfully weathered intensive laboratory and engine tests, there is little chance of finding it on the market this year. But when it does arrive, substantial cash savings will accompany it.

During the course of experimental work—carried out in conjunction with Ethyl Corp.—Hughes and associates discovered that combustion products deposited on cylinder walls were not insulating (as commonly believed), but contained a catalytic substance which increased octane demand. The greater the deposit, the higher the octane rating needed to prevent knock.

Boron additive blended with tetraethyl lead counteracts this catalytic effect on cylinder walls. Deposits still form, but increased octane de-



EVERETT C. HUGHES: Boron boon for motorists.

mand is repressed. Running a clean engine on conventional leaded gasoline will up octane requirement from 78 to 90 in 100 hours' operation. Comparable operation with boron-type fuel resulted in an increase of only 4 points (78 to 82).

However, certain restrictions go hand in hand with effective use of the new gasoline. Engine must be clean at the first tankful, and from that day hence only boron gas can be used if anti-knock performance is to be maintained.

Hughes emphasizes that boron gasoline is still in the process of commercial development. Should it mean only a 10-point reduction in octane requirements, consumer savings would be substantial and more tetraethyl lead could be diverted to defense channels. Regular-grade gasoline now has an octane number between 85 and 80; premium is rated from 90 to 94. Aviation gasoline is 100 octane, but 115 is in great demand.

According to Hughes, high cost of superior octane gasoline is the big problem holding up the advent of high compression automotive engines. Boron may be the solution.

**Silver Fluoride:** Harshaw Chemical Co. has rights to a new method for preparing silver monofluoride. Fluorine gas is passed over a heated bed of finely divided silver chloride. Product, consisting mainly of silver difluoride is reduced to the mono salt by heating in a current of natural gas or one of the lower hydrocarbons.

## RESEARCH . . . . .

**Carbohydrate Reagent:** Anthrone-9, 10-dihydroketoanthracene—a reagent useful for both qualitative and quantitative determinations of carbohydrates is now available from Jasonols Chemical Corp. Quantitative analysis is accomplished by means of spectrophotometric measurement of reaction product-color.

Anthrone may be applied to determinations of mono and polysaccharides and their esters. Moreover, it is valuable for detecting gums, glucosides, starches, and complex sugars with such organic groups as glycolipids and nucleic acids. Few substances interfere with the reagent.

**Weed Killer:** New patent claims application of an aqueous solution of 1 part alkali salt of a higher alkyl sulfate in 5 to 25 parts water will kill weeds. Soil remains fertile and germination of grass-seed is not prevented. Most efficient compounds are 2-ethylhexyl, tetradecyl, and heptadecyl sodium sulfate.

**Coating Solid Alkali:** Research at Mathiesen Chemical Co. has come up with a novel protective coating-treatment for alkali-containing solids. Aldehydes that do not possess a hydrogen atoms form a non-hygroscopic envelope when allowed to react on alkali surfaces. A briquet of sodium hydroxide, sodium pyrophosphate, and sodium silicate was dipped into undiluted benzaldehyde and air-dried. After several hours, briquets could safely be handled with bare hands.

**Pyrethrin Synergist:** Japanese investigators report that safrole—among other volatile constituent of camphor oil—is synergistic with pyrethrins in its knockdown and lethal effect on mosquitos. In tests with standard strain mosquitos, pyrethrins used in conjunction with safrole were about twice as lethal as pyrethrins alone.

**Dust Probe:** U. S. Public Health Service grants to the University of Southern California School of Medicine and the University of Utah will make possible a study of the harmful effects of radioactive ores and dusts from uranium mining and milling operations.

April 7, 1951

# BECKMAN

—and only Beckman—

**provides such wide range versatility  
in Glass pH Electrodes . . .**

The importance of modern pH equipment is widely recognized in many fields . . . from food processing to sewage treatment—mining and smelting to electroplating—textile manufacturing to sugar refining. But when considering pH equipment for your problems always remember this . . .

**"No pH meter is better than electrodes designed for use with it!"**

Only Beckman provides such a wide variety of versatile, accurate and dependable electrodes—a type to meet virtually every industrial, research, laboratory and medical requirement. This is your assurance that, in Beckman pH equipment, you have maximum adaptability to widely-varying pH applications.

FREE . . . a convenient 28-page catalog illustrating the complete line of Beckman electrodes and pH equipment is available from your authorized Beckman Instrument dealer. Or write direct!

Whatever your pH electrode requirement, contact Beckman.

**BECKMAN**  
INSTRUMENTS  
INC.

**SOUTH PASADENA 27, CALIF.**  
Factory Service Branches: Chicago • New York • Los Angeles

Beckman Instruments include: pH Meters and Electrodes—Spectrophotometers—Radioactivity Meters—Special Instruments

## Typical Advantages of Beckman Electrodes



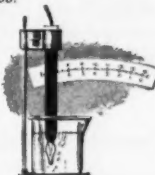
### Virtually Unbreakable

Where abrasive slurries or rough industrial service are problems, Beckman has the answer with electrodes so strong, so tough, so chemically-resistant to alkalis and acids they set entirely new standards of durability!



### Extreme Temperatures

Want to make measurements in solutions as cold as 20°C. below zero . . . or as hot as 130°C. above? Hot, cold or in-between, there's a Beckman pH Electrode to do the job!



### Wide pH Range

Electrodes covering the full pH range permit accurate measurements even at extreme limits with negligible sodium ion error whether test solution is hot or cold!



### Unique Construction

Beckman glass electrodes are factory-sealed, require no maintenance, feature patented internal shielding, heat-resistant construction, integral leads and many other advantages!



# SULPHUR

Many industries are finding that Sulphur Dioxide can be effectively and economically substituted for Sulphur. We would like to consult with you to determine if a satisfactory conversion can be made in your particular case.

SULPHUR-DIOXIDE  
HIGHEST  
QUALITY  
**SO<sub>2</sub>**

Listed below are a few of the industries that are using Sulphur Dioxide to solve many of their production problems today.

<u>Pulp Paper Industry</u>	<u>Leather Tanning</u>
<u>Textile Industry</u>	<u>Metal Refining</u>
<u>Petroleum Industry</u>	<u>Resins &amp; Plastic Manufacturing</u>
<u>Manufacturers of Artificial Silk</u>	<u>Water Treatment</u>
<u>Refrigeration &amp; Air Conditioning</u>	<u>Preserving Fruits</u>

We would be pleased to have one of our representatives consult with you on your problems. Write, wire or call for further information.

TENNESSEE **TC** CORPORATION  
619 Grant Building Atlanta, Ga.

## PRODUCTION . .

### From Pyrites: Cheaper Sulfuric

New FluoSolids roaster will reduce cost of producing sulfur dioxide from pyrite.

Ground pyrite is converted to sulfur dioxide and iron oxide while suspended in an air stream.

A 14-15% sulfur dioxide-bearing gas effluent is produced. Residual solids are sintered to provide blast-furnace charging stock.

Today, any discussion of chemicals eventually comes around to sulfur—i. e., the lack of it. There is plenty of sulfur in pyrites but sulfuric acid plants using this raw material rather than elemental sulfur cost about twice as much to build and three to four times as much to operate.

Now comes the Dorr Co. with its FluoSolids system for roasting pyrite or pyrrhotite ores to yield a high-analysis sulfur dioxide-bearing gas for sulfuric acid production. Dorr claims "... appreciably lower investment and operating costs than with conventional roasting methods." And those who know sulfuric acid best are willing to bet on the validity of the claim despite the fact that Dorr, as yet, has not built a FluoSolids pyrite roaster for a sulfuric acid plant.

**No Novice:** There is plenty of reason for this assurance. While Dorr has built no roasters for acid plants, it has built three pyrite roasters to roast arseno-pyrite gold ores. Two are in the Red Lake District of Ontario—one of them for Cochenour-Williams Gold Mines, Ltd. and the other for Campbell Red Lake Mines, Ltd. A third was installed by Golden Cycle Corp near Cripple Creek, Colo. Successful operation of these roasters bolsters Dorr's claims for the sulfur dioxide-from-pyrite process.

**What Is It?** A FluoSolids roaster or reactor is a modification of the equipment evolved by the Standard Oil Development Co. for fluid catalytic cracking of hydrocarbons. Dorr is licensed under Standard's patents to use the fluid technique in non-petroleum, non-catalytic fields.

In operation, pyrite is ground to pass a 14-mesh screen and fed into the reactor by screw conveyor. The ground pyrite or pyrrhotite may be fed as a slurry for contact acid plants, but for chamber acid plants it must be dry.

Upon entering the reactor, pyrite meets an upward-moving air current which holds the particles in suspension during combustion to convert the

sulfur content of the pyrite to sulfur dioxide. The reactor has no moving parts and maintenance costs are low. Also, experience with the arseno-pyrite roasters has indicated that the refractory life is quite long. As in fluid catalytic plants, temperature of the boiling bed is extremely uniform—usually about 1,000 C for pyrite roasting.

**High Analysis:** Uniform temperature as well as close control of such factors as air admission, provides an exit gas containing 14-15% sulfur dioxide. Pyrrhotite, with its lower sulfur content, produces a gas with 12-13% sulfur dioxide. Standard forms of roasters can produce a gas containing only 7.5-8.0% sulfur dioxide, just about the minimum for operation of a contact acid plant.

Such high-analysis gas reduces costs in still another way. The gas cleaning equipment required to remove the dust or calcine from the off-gas is much smaller than for the usual type of pyrite roasters. Dust carryover is no greater than that encountered in hearth roasters; it ranges from 20-40% of the calcine. The remainder of the calcine is withdrawn from an overflow pipe at the top of the bed.

Sulfur in the calcine can be reduced to 0.5-1.0%, if desired. When the calcine is to be sintered to provide a blast furnace charging stock, 5-7% sulfur is usually left to provide fuel for the sintering operation.

**More Power:** A FluoSolids roaster requires more power than other types of roasting equipment. Major use: To drive the blower that furnishes the needed air. A single-compartment reactor uses about 20 kwh per ton of charge when roasting pyrite containing 35% sulfur.

**Still Costly:** FluoSolids will not provide sulfur dioxide from pyrite as cheaply as it can be produced from elemental sulfur—if you have the sulfur. However, it is a long stride in the right direction and will do its bit to alleviate the present sulfur shortage.



## Wash Bottle



The polyethylene "squeeze" bottle has entered the laboratory. A light squeeze provides a stream of water for washing precipitates or other possible uses. The water stream issues from a 45° tubular polyethylene spout that extends the full depth of the bottle. A two-section assembly permits replacement of the spout in case of damage. Producer: Plax Corp.

## Scale Collector

**Frequent Shutdowns:** A major fault with compression distillation units has been the inability to evaporate scale-forming liquids without frequent costly shutdowns. University of California researchers, doing work for the Army Engineers, found that the scale-formers do not necessarily deposit on only the heated surface. They will deposit on any available surface.

Recent tests have shown that provision of addition-surface can reduce the amount of scale deposited on heat transfer surface to about 5% of that normally formed.

**Tests:** This information was obtained by attaching a metal shell containing sand to the evaporator exit. Brine from the evaporator is circulated through the sand and the greater part of the scale deposited on the sand.

**Metal Analysis:** Nearly instantaneous analysis of metals is provided by Applied Research Laboratories' direct reading spectrometer. It provides pen-and-ink recorded analyses of samples, element by element, within a period of two minutes or less. First applied

to metal analyses, many other uses in general inorganic analysis are being developed.

**Fuel Gas:** Production of fuel gas from wood waste will be tested in a pilot plant planned by the British Columbia Research Council at Vancouver, B. C. It will determine whether gas can be produced from wood waste at a lower cost than from fuel oil. Support of the project has been promised by several industrial companies.

**Combustible Gas Alarm:** Four, six or eight different locations in a plant are protected by a single alarm with Davis Emergency Equipment Co.'s new sampling type combustible alarm system. It has two heated thermocouples, one exposed to the gas being tested, the other unexposed. Passage of combustible material over the exposed thermocouple raises its temperature. The temperature difference between the two thermocouples is a measure of the per cent combustible.

**Check Valve:** An ultra-sensitive check valve for low pressure applications is being produced by James-Pond-Clark. Manufactured in brass or aluminum, the cracking pressure for the valve is 4" to 8" of water. The seal is obtained by a poppet with a machined knife edge impressed into the surface of an "O" ring. Metal-to-metal contact between the poppet and valve body carries the full load after the knife edge is pressed a few thousandths of an inch into the "O" ring.

**Flow Interlock:** General Electric Co. has developed an improved flow interlock, a device which opens or closes an electrical contact with a change in the rate of flow of water. A single screw will set the circuit to respond to any flow rate from 0.5 to 4.0 gallons per minute. The maximum flow differential for operation is 0.1 gallon per minute.

**Air Lock Feeder:** Positive accurate feeding of powdered and granular products into pneumatic materials handling systems is provided by a new rotary air lock feeder produced by Prater Pulverizer Co. The rotor, driven by a ½ hp motor reducer, has machined slots for renewable rubber wiper strips. These provide a tight flexible seal against air leakage.

**D. O.**  
problems today -

but we're building  
for the future: even  
faster and better

**DRIER  
STABILIZER  
PLASTICIZER**

service is in  
the making at



As you know, defense needs, plus peak demands, for paint, varnish, plastic and rubber chemicals make it impossible for us to take care now of many of your requirements—much as we would like to.

With unwavering adherence to rigid Advance standards we are doing everything possible to furnish all you need when you need it.

Please, feel free to consult our technical service staff on any of your problems.

**ADVANCE**  
SOLVENTS & CHEMICAL CORP.  
245 Fifth Avenue  
New York 16, N. Y.



The long and  
short of it is...

if you want information on

## CRESYLIC ACID

or the cresylic acid situation

call or write

### CONCORD CHEMICAL COMPANY

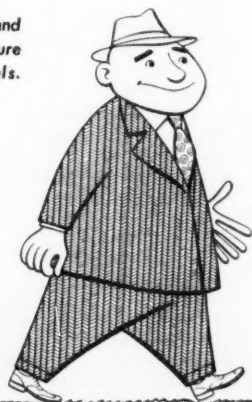


MOORESTOWN, NEW JERSEY • Moorestown 9-1100

CRESYLIC ACID • JAPAN AND CARNAUBA WAX REPLACEMENTS  
CANDELLILLA WAX • REFINED TALL OIL

*Concord Cresylic Acid is supplied in both light and dark types for many uses including the manufacture of disinfectants, plastics, and textile chemicals.*

MOORESTOWN, N.J.



# SPECIALTIES . . . . .



MESQUITE CONTROL: Another rise for 2,4,5-T.

## Beating Brush With 2,4,5-T

Mesquite control with 2,4,5-T herbicides gets boost as USDA shares cost with ranchers in new Southwest program.

Chemical brush control on rights of way will require more 2,4,5-T too. New esters alone or in combination with 2,4-D, supplement 2,4-D and ammonium sulfamate in keeping transmission lines brush-free.

2,4,5-T appears best for dormant season spraying, offers advantages of year-round brush control.

The program of eradicating mesquite and other "competitive" plants in the Southwest is under the Production and Marketing Administration of the U. S. Department of Agriculture. It pays half the ranchers' cost, for the work, but this cost can't exceed \$5 an acre. No rancher or farmer can get more than \$2500 a year for his part in it.

How big the program is can't be determined yet. There is no specific amount set aside for this work; it comes from USDA's annual "conservation appropriation" which for this fiscal year is \$282.5 million. Moreover, county PMA committees must approve the work before it is eligible for payment. Until requests from these local committees reach Washington and payment is made, the size of the program can't be known.

On such large scale operations as will be involved, spraying with 2,4,5-T is estimated to cost about \$3 an acre, considerable less than the \$5

maximum. Low volatile esters, diluted with kerosene or diesel oil at the rate of one pound acid to 10 gallons, are used. The quantity varies a little with the type of weed and the method of application. Some is sprayed from airplanes.

**Cowhand's Lament:** Continued spreading mesquite over range lands of the Southwest has become a serious problem to cattle raisers. Some 55 million acres of grassland in Texas alone are estimated to have mesquite growing on them. It lowers the productivity of the land, covering it in many areas with dense brush that robs grass of moisture and nutrients. Livestock is harder to manage, and range improvement practices are difficult.

Previous efforts to combat the mesquite invasion have employed kerosene and fuel oils, hand grubbing, root cutter plows, cables attached to tractors, bulldozers and the like. These

have been effective under favorable conditions, but too costly for broad-scale control.

The Texas Agricultural Experiment Station at Spur, Tex. in cooperation with the USDA Bureau of Plant Industry has made mesquite control one of its major activities. Since 1945, it has been experimenting with hormone-type weed killers, first with 2,4-D and then with 2,4,5-T. Its latest work shows that low-volatile esters of 2,4,5-T have given the most effective control under a wide range of conditions at lower rates than any other chemicals tried thus far. Moreover, these esters, the propylene glycol butyl ether and the butoxy ethanol esters, are safer than the more volatile alkyl esters in areas where susceptible crops are growing. Less effective has been the 2,4,5-T amine salt as an emulsifier must be added in making up formulations, and the prevailing hard water usually reduces its effectiveness. Formulations of 2,4-D, on the other hand, have been inconsistent and generally ineffective.

**Power Line Cutter:** 2,4,5-T's part in the mesquite control program may be the most spectacular development to a nation anxious to increase its beef supply. Its use in keeping rights of way for transmission lines, railroads and highways clear of brush, however, is much the more substantial outlet at present, and one which will continue to expand. In 1948, when esters of the then-new herbicide were available only in small quantities, practically all went for this purpose. Power line companies had been using 2,4-D, but found that the new compound was especially effective against brush and woody plants that were resistant to 2,4-D. Most of it was used in combination with 2,4-D, and today combinations of the two are generally available.

What companies concerned with this problem of right-of-way maintenance think of chemical brush control was very evident at the Fifth Annual Meeting of the Northeastern Weed Control Conference earlier this year. The general feeling was that chemical methods are here to stay. H. C. Ferguson, chief forester of Penn Line Service, for example, stated that high volume spraying with equal parts of 2,4-D and 2,4,5-T was his method of converting woody areas into desirable rights of way, and dormant basal spraying with 2,4,5-T, his method for maintaining the cleared area.

While the swing to chemicals is

## SPECIALTIES . . . . .

definite for such work, it is not all 2,4-D and 2,4,5-T. Ammonium sulfate, a non-hormone type and much less selective than either of the other two, is widely used. It is more effective against some species of brush, less against others. Which is used depends upon the brush problem involved.

**December as in May:** Dormant basal spraying, the method advanced for right-of-way maintenance, has been under development by Dow Chemical Corp. and various government agencies for the past five years. Now instead of being restricted to the months when brush is in leaf, applications can be made in any season. The lower portions of brush stems or tree trunks are sprayed to a height of 12-18 inches from the ground line. Good results have been obtained in all seasons, although early winter and late spring treatments seem to be superior.

The effect of this treatment takes different forms. After the dormant season, some plants don't leaf at all, or only partially before dying. Other types foliate normally, but wither during the summer.

In basal bark spraying, 2,4,5-T has proved to be better than 2,4-D with the exception of a few species. One pint of the chemical to three gallons of diesel oil or kerosene is the recommended formulation. The same mixture is sprayed on the bark and cut surface of stumps to prevent resprouting.

**Bigger Markets:** These developments spell larger sales for 2,4,5-T in its many forms. Expansion, like that of other agricultural chemicals, is being hampered by raw material shortages, particularly of benzene and chlorine.

Producers,\* however, are continuing to push research, and are making the less volatile esters available to formulators. When greater supplies can be had, there will be willing purchasers.

**Methyl cellulose capsules:** Eli Lilly and Co. has patented (U.S. 2,526,683) a telescopic medicinal capsule made from a thermogelled film of a water-soluble methyl cellulose.

A 15%-20% mixture of methyl cellulose with boiling water is cooled to 5° to make a clear bubble-free solution. After lubrication, drying and cooling, the capsules are cut to size. Plasticizers can be added.

\* Among the principal ones: Dow, Monsanto, Koller Chemical, Pittsburgh Agricultural Chemical, Du Pont, American Chemical Paint.



**CONCRETE WALLS:** Sweating ends with silicones.

## Waterproof Paint

New water-repellent coating for masonry, now being distributed in the West, Southwest and South, is claimed to give protection with two thin coats. The government is interested in the new formulations for its buildings, and the manufacturer, a small Los Angeles company, is adding dealerships.

What Arid does for underarms, Arid silicone-based paint does for perspiring stucco walls. From here on, the two products with similar names, but manufactured by different companies, go their separate consumer ways.

Arid paint—for stucco, cinder-brick, concrete, masonry—is described by its manufacturer, the Arid Corp., Los Angeles, as a pigmented waterproofing paint, incorporating silicone oil and other specially-formulated oils and pigments in a new paint-manufacturing technique.

In a neat year-old plant, Arid Corp. is presently able to mix 8,000 gallons of its silicone product a month—when it can get the pigments. Arid itself is about a year and a half old, and has just now broached the market in its struggle for recognition among painting contractors who can't always fathom a paint which comes as a paste, and which is then thinned using 50% mineral spirits.

The government, admittedly enthusiastic about the water-proofing formula which requires but two coats to do the job many another waterproofer tries to do in more, has applied Arid to some of its buildings in Boulder City, Nevada. The Navy has just ordered more.

**Porous Yet Impervious:** Specifi-

cally, the manufacturers of Arid claim that it allows breathing through the surface, thus allows the escape of water vapors, which cause peeling, checking and blistering on porous construction surfaces. Other claims: it is impervious to surface moisture; prevents deterioration of mortar joints; is anti damp rot and anti fungi; retards hair-checking; stays in complete suspension. These claims are based on the repellent qualities of Arid's water-proofing ingredients.

Arid, which comes in seven colors and white, and is packaged in 1 and 5-gal. pails, got its start when consulting chemist DeWitt Payne brought a sample around to the offices of the Associated Printing Contractors.

Walter Hoag, the Association's president and George Kilgour, its secretary, took one look and agreed to run some sample tests on porous cinder blocks. They liked what they saw. After a year's experiments, during which Kilgour and Hoag turned samples over to two private testing laboratories for confirmation, they bought the formula from Payne, retained him as chief chemist, and incorporated. To date they've invested a modest \$25,000 in plant and equipment—and think they've got a good thing—providing pigment and silicone supplies don't peter out in the wake of national rearmament.

**Arid Heads East:** Marketing has been through dealers and thus far Arid has covered the west pretty well, done almost as well in the south and southwest. They are looking toward expansion of dealerships in the east.

Kilgour, who's president of the corporation, a one-time painting contractor turned manufacturer, says it's the special way in which linseed and soy and half a dozen other oils are cooked and the silicone added which gives the results.

"A chief advantage," explains Kilgour who wielded a paint brush himself in earlier days, "besides waterproofing is that you don't have to lay Arid on thick to waterproof. That way, pores in cinder blocks and concrete stand out decoratively—as they should.

"You end up with a grained surface, not a flat one. Thick coatings peel off as any home-owner can tell you."

Usually two coats are enough for the job, the manufacturers claim, and no oils, only mineral spirits, are used as a thinner.

A 1-gal. can of white Arid retails for \$5; 5-gal. white, for \$24.50.

Kilgour is hopeful that more and more perspiring walls will turn to Arid—to be safe.



## SPECIALTIES . . . .

**Thread Compound:** Led-Plate, a suspension of metallic elements (over 70% powdered lead) in hydrocarbons, has been developed by Armite Laboratories, Los Angeles, as a sealer and lubricant for pipe, bolt and stud threads and gasket faces. Because the formulation does not dry out, there is no seizure to prevent later disassembly. Effective in temperatures ranging from minus 350F to plus 2900F, it can be used for steam, gas, water, oil and various chemical connections.

**EPN for corn borer:** The miticide EPN 300 (ethyl p-nitrophenyl thionobenzenephosphonate) introduced by Du Pont last year (CI, Mar. 1950, p. 349) has been found by University of Minnesota to give good protection against the European corn borer.

Good results were obtained from both dusts and sprays. As a dust, a 2% mixture applied at 30 lbs per acre proved outstanding.

**Non-melting wax:** Flexrock Co., Philadelphia, has developed a non-melting wax. In about four to six weeks, the company will be in a position to produce a "fair amount" of the new wax, but currently is providing sample lots only to industrial users of wax.

Because of the patent pending, Joseph J. Hitov, head of research, won't divulge what the company uses in its new mixture to give wax with absolutely no melting point. However, it is an additive and not a new wax *per se*. The finished wax is harder than the starting wax and is slightly tannish in color. (The hope is that such a wax eventually will be colorless.)

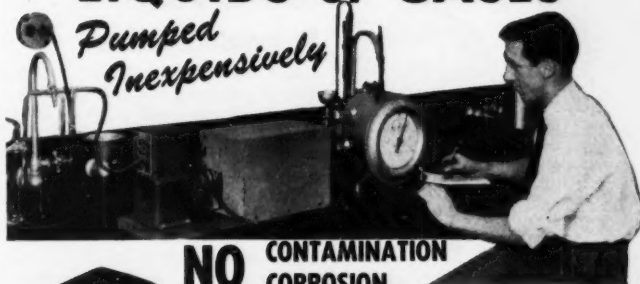
The company claims it can take any standard wax and convert it into a non-melting wax, adaptable for industrial uses mainly. It will do the mixing, purchase the wax and provide the finished mixes for industrial users. Eventually, Flexrock will give the new wax a trade name, but not at the present.

**Rust-Oleum addition:** New construction scheduled for the Evanston, Ill., plant of Rust-Oleum Mfg. Co. includes a one- and two-story warehouse and a research lab. Cost will be \$85,000.

### PICTURES IN THIS ISSUE:

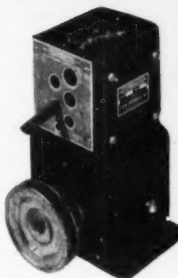
Cover (bottom picture) Davey Tree Export Co.; p. 9—H. K. Ferguson Co.; p. 10—Wide World; p. 14—Ewing Gallo-way; p. 19—Commercial Solvents Corp.; p. 25—U.S. Department of Agriculture.

## LIQUIDS or GASES



**NO CONTAMINATION  
CORROSION**

**SIGMAMOTOR**



Chemical research workers and process engineers are finding the new SIGMAMOTOR a reliable and inexpensive aid in moving fluids. You avoid high costs of stainless steel, rubber or glass coatings because the SIGMAMOTOR moves liquids by the pressure of "Fingers" on flexible tubing.

In the laboratories of the Hooker Electrochemical Company (illustrated above), the SIGMAMOTOR is used for routine gas sampling and analysis.

SIGMAMOTORS can be used for small flows or proportional flows of two or more liquids. Flow rates range from 1 1/2 to 30 gals. per hr. without speed changes. Quickly adaptable to handle different fluids and solids in solution.

Send TODAY for complete, detailed folder on the efficient, economical SIGMAMOTOR.

**E&M**  
**ENTERPRISES, Inc.**  
8 VERNON ST.  
MIDDLEPORT  
NEW YORK



- Mild Climate
- Fine Rail, Water & Air Transportation
- Good Living Conditions
- Cooperative Labor
- Abundant Natural Resources

Existing plant facilities available for prime or sub contracts in many lines of defense work.

For further information, address—

**Department of**

**COMMERCE AND INDUSTRY**

**State of Louisiana • Baton Rouge, La.**

Mary Evelyn Dickerson, Executive Director



for  
Aluminum  
Hydroxide  
Gels  
of uniform  
excellence,  
remember  
that name...

**REHEIS**



REHEIS COMPANY, INC.  
BERKELEY HEIGHTS, NEW JERSEY

## PACKAGING.....

### Volcanic Packing

Latest candidate for honors in the field of packaging materials is Ozark-Mahoning's expanded perlite. Lightweight, resilient, and absorbent, it seems ideally suited for a packing agent for fragile items. And unlike its vegetable counterpart (popcorn), its use will not bring frowns from the Food and Drug Administration.

This week, officials at Ozark-Mahoning are preparing to launch a campaign; its goal: acceptance of expanded perlite as a packing agent for breakable items. Unmoved by the recent hullabaloo about popcorn for that purpose (CIW, Jan. 20), they feel their "popped" perlite can do the same job, is superior from many standpoints.

**Enter FDA:** The big objection to popcorn as a replacement for shredded paper and other conventional materials is that the Food and Drug Administration takes a dim view of the whole idea. It may pass all the packaging tests, says FDA, but it presents undeniable attraction for children. The agency contends that children might eat the contaminated version, and further suggests that unscrupulous customers might resell—as food—popcorn that had been used in packaging.

At last report, Winthrop-Sterns (sponsor of the popcorn movement) remained undaunted by FDA's attitude, planned to extend the use of popcorn in its shipping operations. Other chemical firms, however, after a warning by the Manufacturing Chemists' Association, cautiously await further ruling on the matter.

**Enter Perlite:** Ozark-Mahoning feels that, in expanded perlite, lies the solution to the whole problem. Although no figures are available to form the basis for a valid comparison, O-M thinks the protection offered by perlite compares favorably with that of popcorn.

One big factor in support of perlite is its high absorption. This property has made possible its use in the company's shipments of fluorophosphoric acids (the perlite would probably be capable of absorbing the entire contents of the bottle).

Another item on the credit side of perlite's ledger is that it is **inedible**. Despite proof offered by Winthrop-Sterns, some packers would be wary of using popcorn on the grounds that it might be a source of attraction for rodents and vermin.

**Cost:** Of prime importance: How



**PACKING IN PERLITE:** Children won't eat it.

does perlite stack up against popcorn costwise? Expanded perlite is sold (in 4-cu. ft., bags) for about 4¢ a lb. Popcorn on the other hand, sells (in 100 lb. bags) for around 10¢ a lb.—not including the costs of popping.

But popcorn has an apparent bulk density of from 2½ to 3 lbs. per cu. ft., while expanded perlite has a density of from 5 to 7 lbs. per cu. ft. On a volumetric basis then, both materials would cost approximately the same.

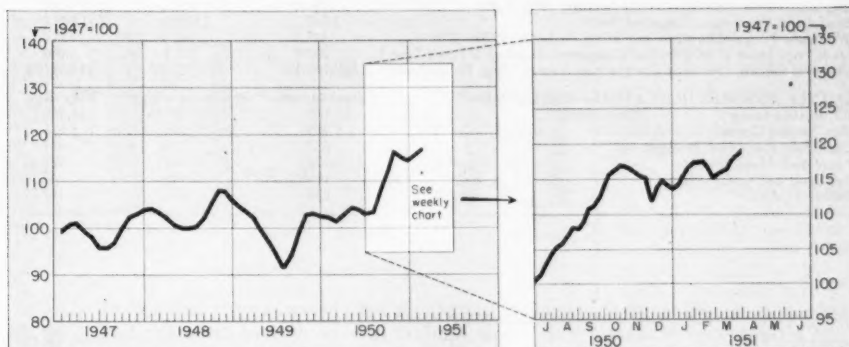
However, popcorn may have one edge costwise: Its lower bulk density would result in slightly lower shipping costs.

**Popping Perlite:** Perlite (a volcanic glass) is essentially an aluminum silicate containing small amounts of water. On heating to temperatures in the neighborhood of 2000°F., it becomes pliable, and the vaporized water exerts enough pressure to expand it to between 10 and 20 times its original volume.

The product is a good insulating material and has found wide-spread use in the building trade as a plaster and concrete aggregate. Ozark-Mahoning (along with other firms) produces it for that purpose; in addition O-M turns out special grades for use in drilling muds and cements for oil wells.

The material that O-M has used for its shipments of fluorophosphoric acids has been a standard grade—10% passing 100 mesh and 30% passing 50 mesh. For packaging purposes, the company is planning to sell a grade free of material passing 50 mesh (to avoid the inconvenience of dust).

# CHEMICAL MARKETS.....



CHEMICAL INDUSTRIES OUTPUT INDEX—Basis: Total Man-Hours Worked in Selected Chemical Industries

By now, England must be convinced that the U.S. has no sulfur to spare for overseas despite the recent bonus allotment of 19,000 tons. Almost any alternative is now being considered including ICT's anhydrite process, recovery from coke-oven gas, importing more sulfur from Sicily and pyrites from Spain.

Another return to the spotlight for carnauba wax provides two contrasting scenes: Brazil within the last few weeks has rapidly boosted exports to the United States; in Washington, industrial users and NPA probe merits of possible substitutes to minimize shortages and stabilize prices.

For the second time in as many months, the railroads seek higher freight rates. The first application for a 6% increase resulted in an interim boost by Interstate Commerce Commission of 4% in the East and 2% in other sections. New application petitions for a substitute 15% increase, citing rapidly mounting operating costs.

Like many an industrial customer, The Reconstruction Finance Corporation, sole buyer of import tin, has had to up the ante from \$1.34 to \$1.46 a pound. Parleys with major tin-producing countries have not yet produced an effective price check.

A swift supply reversal for muriatic acid last week caused a sharp break in price from \$130 a ton to around \$75 in the spot market. The surplus, expected to be short-lived, is chiefly due to stepped-up production of by-product acid in seasonal insecticide manufacture.

Many will look longer and harder for castor oil when imminent allocations by NPA go into effect. Because of urgent requirements for rubber and electrical products, sulfonation and surface coatings usage will be reduced 25-40%, and cosmetics applications will be slashed 75%.

## MARKET LETTER

## MARKET LETTER

### WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	117.8	118.8	103.9
Bituminous Coal Production (Daily Average, 1000 Tons)	1,687.0	1,653.0	2,128.0
Steel Ingot Production (Thousand Tons)	2,047.0	2,069.0	1,843.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	145.5	145.6	116.6
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	215.9	220.4	169.9
Chemical Process Industries Construction Awards (Eng. News-Record)	\$20,465,000	\$27,375,000	\$1,536,000

### MONTHLY BUSINESS INDICATORS—EMPLOYMENT

	Latest Month	Preceding Month	Year Ago
All Manufacturing (Thousands)	13,120	13,017	11,460
Non-Durable Goods	5,795	5,761	5,478
Chemicals and Allied Products	532	526	485
Paper and Allied Products	424	423	386
Petroleum and Coal Products	191	190	183
Rubber Products	222	223	188

Although the chemical industry is not cheered by the prospect of a Controlled Materials Plan, some comfort may be derived from the fact that the provisions are being worked out in consultation with industry advisory groups.

In the state of Kentucky, a chemical industry based on acetylene is gaining stature. Plans now underway by Air Reduction to construct a \$10 million plant for calcium carbide near Paducah, comparable to their plant at Louisville, supplying acetylene to Goodrich for Geon and Koroseal, and to DuPont for Neoprene.

Typical of the rapid recovery of the German dyestuff industry is the progress of the Naphthol Chemie, part of the I.G. Farben combine. Current production is 97% of prewar, with over 60% going into export markets. Productivity of workers there is not far from American standards, better than most other European Countries.

When it comes to price reduction based on process improvement, no phase of the chemical industry has a better record than synthetic pharmaceutical producers. Latest development: Merck & Co. has just brought the price down to less than \$20 a gram, a 90% reduction from the two-year-ago introductory price.

News from the chemical exchange: Although new synthetic gums have made some inroads on alginate usage, constantly expanding applications for both groups satisfy all concerned.

One reason for the short supply position in tartaric acid: Active demand to supplement supplies of citric acid, more than usually scarce this season.

### SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending April 2, 1951

#### UP

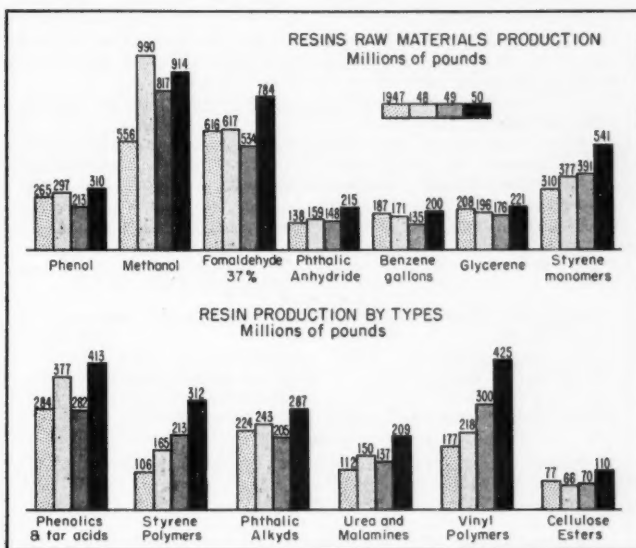
	Change	New Price		Change	New Price
Bergamot Oil, Italian	\$ .50	\$ 8.75	Vanilla Beans	\$ .25	\$ 6.50
Candelilla Wax, refined	.02	.77	Tin	.165	1.505
Carnauba Wax, refined	.03	1.28	Tungsten	2.20	8.00
Orange Oil, sweet distilled	.10	1.10			

#### DOWN

Cocoa Butter	.02	.75	Cortisone, gram	3.20	19.20
Coconut Oil, crude, tanks, Pac.	.005	.205	Menthol, nat. USP	.80	12.00
Copra, cif. Pac. ports, ton	2.50	270.00	Shellac, refined, bags	.03	.68

All prices per lb. unless quantity is stated





## Raw Materials Curb Resin Output

A severe shortage of raw materials is now clamping a ceiling on synthetic resin production.

Despite expanding production of resin monomers the outlook remains bleak.

Synthetic resin production was upped 50% in 1950 to a record 2.25 billion pounds. And it is still going up—fast. But production has now outrun the available raw material supplies for all of the major classifications. Further expansion will be governed more by raw material availability than by resin demand.

A raw material supply squeeze is nothing new for the synthetic resin industry. However, last year the shortage of raw materials was primarily limited to chlorine, benzene and glycerine. Then the existing shortages could be partially overcome by substitution of plastics manufactured from alternate raw materials. Today this is no longer possible. The dearth of raw materials is industry-wide. The only variation is one of degree.

**Benzene:** It is academic to argue which resin raw material is in the shortest supply, but benzene can and, to Uncle Sam, has presented a very strong case. The benzene-from-petro-

leum program is one of the few that has received certificates of necessity for complete amortization of the new facilities in five years.

When this program is completed nearly half of all benzene produced in the United States will come from petroleum. But it is questionable whether even this increased quantity of benzene can meet needs without continuing present imports. Bakelite has just started to operate a sizable synthetic phenol plant at Marietta, O. New styrene capacity is expected to come into operation in the near future for both Dow and Monsanto. Koppers is also expanding its styrene producing facilities but these will not be available before the summer of 1952 at the earliest. All, of course, will require benzene.

**Phthalic Anhydride:** The supply situation on naphthalene, major phthalic anhydride precursor, is much the same as that for benzene, but lacks the impetus for new supplies provided by the high-priority synthetic rubber

program. There is insufficient production from domestic coal tar sources. At present the deficit is being met by imports; petroleum sources will eventually make up the difference. Naphthalene, itself, cannot be prepared from petroleum. But ortho xylene, which is now being derived for petroleum phthalic anhydride production, is available in large quantities.

Unfortunately ortho xylene can't be used in existing phthalic plants without substantial modification. It is available, however, for use in any new phthalic expansion that might be made. This assures a reasonable supply of phthalic from domestic raw materials for alkyls and for the phthalate ester plasticizers which make up 30-50% of the total weight of vinyl resins.

Currently, the supply of polyalcohols, principally glycerol and pentaerythritol, is a greater limitation on alkyl output than phthalic anhydride. Both are being expanded, however. Vinyl production is limited by the availability of both chlorine and acetylene.

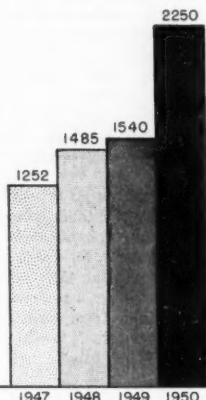
**Acetylene:** A few months ago there was a large acetylene plant lying idle at Ashtabula, Ohio. This unit was recently leased from the government by Union Carbide, which is adding another unit at the same location. National Carbide is planning to build at Louisville, Ky., while Monsanto is building the first acetylene-from-natural gas plant at Texas City, Texas. A large portion of Monsanto's output will be converted to vinyl chloride. Expansions of vinyl units near the other two installations will also require acetylene—undoubtedly to come from these new facilities.

**Chlorine:** Vinyl and phenolic resins are both dependent upon adequate supplies of chlorine. Industry is plowing money into chlorine facilities at a record rate (p. 9) but production of phenolic resins and vinyls has expanded even faster. Vinyl output will require increasing quantities of chlorine, as large vinyl resin plant expansions are under way by a number of companies.

Phenol production will continue to go up but without benefit of chlorine—Bakelite's new plant uses a version of the Raschig process, which has an extremely small consumption of chlorine as hydrochloric acid.

**Formaldehyde:** The tremendous surge in production of phenolic, urea, and melamine resins has completely changed the formaldehyde supply picture (CIW, Feb. 10, 1951). From a

TOTAL U. S. RESIN PRODUCTION



position of very comfortable supply last year, formaldehyde has joined the other short materials. This can be remedied in two ways: More facilities can be installed for its production by direct oxidation of hydrocarbons, or additional methanol-producing units can be built. Celanese is presumably following the first route in its new Southwest venture (*CIW*, March 31, 1951) but, as yet, no plans are known for additional methanol plants.

**Urea:** Without the additional capacity provided by Solvay's new urea plant, it is doubtful whether there would be a formaldehyde shortage. Without this unit the huge expansion in urea resins for Plaswood (*CIW*, Feb. 3, 1951) would have been impossible. But these new materials have caught on so well that there is a shortage of both urea and formaldehyde. The U.S. produces insufficient urea to meet all demands and large tonnages are being imported from Norway to fill the gap.

The continued growth of Plaswood sales and the large urea supply deficit that exists would seem to make the time ripe for installation of additional urea plants.

**Cellulose:** The supply of dissolving pulp is controlled by demands for the production of acetate and viscose rayon, the output of which is at an all-time high. The volume of cellulose plastics is so small in comparison with rayon production that the plastics end of the industry is to a certain extent a step child of the rayon industry. This is more striking when it is remembered that a short time ago the demise of the cellulose plastics industry was freely predicted. Reason:

Rapid introduction of the less expensive polystyrene molding powders.

Increased supplies of dissolving pulp are on the way, but increased rayon capacity is also projected.

**No Raw Material:** The present state of the synthetic resin industry can best be summed up by a four word phrase: not enough raw material.

### Government Needs

Chief, Procurement Div., Supply Service, Veterans Administration, Washington 25, D.C., will receive bids until Apr. 9 on invitation No. A-86 for the following pharmaceuticals ranging from 96 to 960 bottles each:

Aminoacetic Acid (1 lb.)	Pilocarpine Hydrochloride (¼ oz.)
Citric Acid (1 lb.)	Potassium Hydroxide (¼ lb.)
Colloidal (1 oz.)	Potassium Dichromate (¼ lb.)
Iodine	Uranyl Acetate Sodium (¼ lb.)

Until Apr. 13, on invitation No. 87-A for 192 to 5,904 bottles each of the following:

Hexavitamin Capsules	Glyceril Trinitrate tablets
Seconal Sodium Capsules	Quinidine Sulfate tablets
Triasyn B Capsules	Saccharin Sodium tablets
Diphenylhydantoin Sodium Capsules	Sodium Chloride tablets

Raritan Arsenal, Metuchen, N.J., will receive bids until Apr. 11. Invitation No. 51-406 for 14,040 lbs. manganese carbonate (10 lb.) and on invitation No. 51-407 for 10,500 each. Talcum, tech. (Soapstone) (1 lb.).

Aviation Supply Office, 700 Robbins Ave., Philadelphia, will receive bids until Apr. 11 on Inv. B-54011 for 40,000 gals. interior gloss enamel, and 190,000 gals. interior and exterior paint.

Regional Director, General Services Administration, 1800 Fidelity Bldg., Kansas City 6, Mo., will receive bids until Apr. 10, on Inv. No. KC-14360 for 52,000 lbs. sweeping compound.

Federal Supply Service, GSA, Room 528 U.S. Courthouse, 219 S. Clark St., Chicago 4, Ill., will receive bids until Apr. 12, on Inv. No. CH-29085 for:

8,000 lbs. Laundry soap chips	156 gals. Pine odor disinfectant (1 gal. cans)
10 cases Soap grit for scouring	1,200 cans Toilet bowl cleaner (22 oz. cans)
24,000 cakes (10 oz. size) Soap grit	150 containers Naphthalene flakes (100 lb. containers)
480 cartons Powdered toilet soap for dispensers	300 pks. (1 lb.) Naphthalene flakes
864 Deodorant blocks (4 oz.)	

Chief, Material Section, U.S. Weather Bureau, Washington 25, D.C., until Apr. 10 on Inv. No. 92-WB-51 for 15,000 rubber antenna seals for the Bureau's 403-MC type Radiosonde.

Purchasing Agent, Post Office Dept., Washington 25, D.C., until Apr. 11, on Inv. No. 3411, for 60,000 lbs. painted surface cleaner (Powder, Type I), and on Inv. No. 3412 for 283 containers of Trisodium phosphate.

Navy Purchasing Office, 111 E. 16 St., New York, for the following:

Bids Close	Inv. No.	Quantity	Item
Apr. 17	8530	170,000 lbs.	Soda Ash
		2,500 tins	Calcium hypochlorite powdered
		200,000 lbs.	Laundry soap powdered
		275,000 lbs.	Laundry soap powdered
		65,000 lbs.	Laundry starch
		500 pts.	Marking ink indelible
Apr. 23	8569	16,500 gals.	Tetrachlorethylene
	8603	80,000 lbs.	Niter cake
Apr. 24	8572	43,000 lbs.	Sodium cyanide

# BOOKS . . . . .

**Artificial Fibres** by R. W. Moncrieff.  
John Wiley & Sons, Inc., New  
York, N. Y.; 313 pp., \$4.50.

The entire story of artificial fibres is given in this book, from the architectural features of the component molecules to the uses for which the ultimate artificial fibre is suitable. Essential aspects covered include the historical and developmental background as well as the chemical nature, manufacturing processes, dyeing properties and uses of the individual fibres.

Covering three general groups of fibres—regenerated cellulosic and alginic fibres, regenerated protein fibres, and synthetic fibres—the book begins with a review of the fundamental conceptions of the structure and properties of the fibres. After a detailed treatment of each group of fibres, the author discusses the subject of processing, dyeing, and delustering. A chapter on tested methods of identification of fibres closes the book.

**Distillation**, edited by Arnold Weissberger. Interscience Publishers, Inc., New York, N. Y.; xxvii+668 pp., \$14.

The fourth in the series covering in a comprehensive way, "The Technique of Organic Chemistry", this volume deals with the process of distillation, one of the chief operations used for the isolation and purification of volatile compounds. Written by a group of experts in their respective fields, this book presents a thorough account of the theory and practice of batch distillation on a laboratory scale. The author of each section provides an explanation of the theory underlying the special type of distillation he is discussing, in addition to the laboratory apparatus and procedures employed, equipment performance, and typical industrial applications of the process. Various forms of distillation outlined are ordinary fractional distillation, extractive and azeotropic distillation, distillation of liquefied gases and low-boiling liquids and distillation under both moderate and high vacuum.

**White Mineral Oil and Petrolatum**, by Erich Meyer. Chemical Publishing Co., Brooklyn, N. Y.; 135 pp., \$4.75.

Giving information and data on the physical and chemical properties, sources and applications of white mineral oil and petrolatum, this book will be of service to chemists, engineers, manufacturers and all users of the products. Based on industrial re-

search by the author, and on laboratory and factory experience, the volume covers in detail the technical aspects of the subject including the ingredients and nature of crude oil, its refining by chemical treatment, manufacturing processes and quality standards. Another section covers the applications of the products in various industries, providing formulas and specifications for each use. Additional chapters treat testing methods and handling provisions.

**The Amino Acid Composition of Proteins and Foods**, by Richard J. Block and Diana Bolling. Charles C. Thomas, Springfield, Ill.; xxviii+576 pp., \$10.50.

Second edition of monograph collates for the average reader the widely scattered literature on the methods and results of protein analysis and presents this information in convenient form. Enlarged to include new advances made in the field since 1945, this volume explains the newly developed use of biological methods employing micro organisms and specific enzyme systems for the routine estimation of all the known amino acids. Giving the theoretical background, historical development, selected reagents, experimental procedure and the limitations in each case, the authors describe the methods used in determining the 21 commonly accepted and six other amino acids in protein foods. Experimental directions are provided for the determination of these amino acids by means of the gravimetric, colorimetric, gasometric, enzymatic, iodometric, polarographic and oxidation methods.

## Briefly Listed

THE SCHIMMEL ANNUAL REPORT ON ESSENTIAL OILS, AROMATIC CHEMICALS AND RELATED MATERIALS, 1947-1948, latest in series presenting detailed record of scientific and commercial developments, research and other information in the field of essential oils and aromatic chemicals during the stated years; the book follows an alphabetical arrangement and contains varied illustrations and bibliography. Published by Schimmel & Co., Inc., 601 West 26th St., New York 1, N. Y. at the price of \$3.

THE PRODUCTION OF BORON FLUORIDE BY ACID METHODS, by G. Riess and E. M. Polykova, a report translation from the "Journal of General Chemistry" of the U. S. S. R., Sept., 1949. Reports results of experiments conducted to determine the boron fluoride yield by acid methods of production as a function of the conditions employed. Can be procured from Consultants Bureau, 152 West 42nd St., New York 18, N. Y. for \$5.

## AMMONIUM ACID FLUORIDE

## MAGNESIUM SILICO FLUORIDE

SPOT DELIVERIES

## HENRY SUNDHEIMER COMPANY

103 Park Ave., New York 17

Telephone: MUrray Hill 5-4214

Fluorine Specialists for Over 40 Years

## Send For This Valuable Mailing List Data!

To aid you in planning your direct mail, check any of these mailing lists you may be interested in . . .

- ☐ Business Executives
- ☐ Electrical Appliance Dealers
- ☐ Manufacturing Industries
- ☐ Metal-Working Industries
- ☐ Aviation Industries
- ☐ Bus Industry
- ☐ Chemical Processing Industries
- ☐ Civil Engineering and Construction Industries
- ☐ Coal Mining Industries
- ☐ Electrical Industries
- ☐ Electronic Engineers
- ☐ Food Industries
- ☐ Metal Mining Industries
- ☐ Power Plant Engineers
- ☐ Product Design Engineers
- ☐ Textile Industries
- ☐ Welding Industry

. . . attach this 'ad' to your business letterhead . . . and mail. We'll send you complete information, selections, list counts, and prices. No obligation, of course.

Direct Mail Division

## McGRAW-HILL Publishing Company

330 W. 42nd St., New York 18

# SEARCHLIGHT SECTION

EMPLOYMENT •

BUSINESS •

OPPORTUNITIES •

EQUIPMENT—USED or RESALE

## UNDISPLAYED RATE:

\$1.20 a line, minimum 4 lines.  
To figure advance payment count 5 average words as a line.

EMPLOYMENT WANTED and Individual Selling Opportunity undisplayed rate is one-half of above rate, payable in advance.

PROPOSALS, \$1.20 a line on insertion.

NEW ADVERTISEMENTS received by 10 A. M. April 11th at the New York Office, 330 W. 42nd St., New York 18, N. Y., will appear in the April 21st issue subject to limitations of space available.

## INFORMATION

BOX NUMBERS count as one additional line in undisplayed ads.

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

## DISPLAYED RATE:

The advertising rate is \$9.75 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches—to a page C. I.

**"CONSOLIDATED"**

**BUYS—SELLS  
USED MACHINERY  
AND EQUIPMENT  
FOR THE CHEMICAL  
AND PROCESS INDUSTRIES**

Including Paint, Food, Rubber, Plastics, Sugar, Drugs, Cosmetics and Allied Fields. From a single item to a complete plant.

**CASH FOR YOUR IDLE EQUIPMENT.**

**CONSOLIDATED  
PRODUCTS COMPANY, INC.**  
14-18 Park Row, New York 38, N. Y.  
BRaclay 7-0600

## CASH PAID

For Capital Stock or Assets of

## INDUSTRIAL ENTERPRISE

### • WANTED

By large financially powerful diversified organization wishing to add another enterprise to present holdings.

Existing Personnel Normally Retained  
Box 1210, 1474 B'way, N. Y. 18, N. Y.

## ACCOUNT WANTED

Manufacturer's agent, well established, covering Michigan for AAAA-1 industrial chemical company and AAA-1 container company desires additional non-conflicting account.

R A 9374 CHEMICAL INDUSTRIES  
520 No. Michigan Ave. Chicago, Ill.

REPLIES (Box No.): Address to office nearest you  
NEW YORK: 330 W. 42nd St. (18)  
CHICAGO: 520 N. Michigan Ave. (11)  
SAN FRANCISCO: 68 Post St. (4)

## BUSINESS OPPORTUNITY

PARTY WISHES to purchase formulas and manufacturing process for Puttys, Caul King Compound, Metal Drawing Compound and Spray Booth Coatings. Proven products wanted. If interested write care of BO 9216, Chemical Industries.

## PROFESSIONAL SERVICES

## EVANS

RESEARCH AND DEVELOPMENT CORP.  
Chemical Research • Processes • Products  
Development Problems  
Complete Laboratory • Pilot Plant • Mechanical and Optical Sections  
Ask for NEW Scope Sheet C listing over 100 of our activities.  
250 East 43rd Street, New York 17, N. Y.

## SPECIAL OFFERINGS

- 2 Pressure Leaf Filters, 316 s.s., having 20-24" dia. leaves, like new
- Day 15 gal. Jktd. Mixer, 2 cored Masticator Arms, with gear reducer & 5 HP motor
- Day S.S. 5 Gal. Double Arm Vac. Mixer
- Mikro #3TH with 40 HP AC motor
- Many Other Items Available.

## EQUIPMENT CLEARING HOUSE, INC.

289-10th ST. BKLYN 15, N. Y.

## FOR SALE

- 4 Selectro Vibrating Screens, 2'x7', two deck, enclosed, stainless steel.
- 2 Mikro Pulverizers, #1-S1, #2-S1
- 1 Hardinge Conical Ball Mill, steel liner, 4'6" dia. x 24"
- 10 Stainless Steel Tanks, Type 316, closed, 50, 80 and 325 gal.
- 1 Rotary Vacuum Filter 8' x 8' Acid Proof, Rubber & Lead.

**PERRY EQUIPMENT CORP.**  
1521 W. Thompson St.  
Phila. 21, Penna.

**J** NEW 1000 lb. powder mixer. Devine 9 shaft vac. dryer—40 x 42. Fitzpatrick Model D stainless comminuting machine—3 H.P.

**What Have You For Sale?**

**ASPER MACHINERY CO. INC.**  
1123 BROADWAY 10, NEW YORK  
CHelsea 3 9010 9011

## NOW YOU CAN MAKE CONTACT WEEKLY

with the important buying influences throughout the chemical and chemical process industries.

## THROUGH the SEARCHLIGHT SECTION

for positions wanted or vacant, for used or surplus new equipment, for business opportunities, etc.

## THROUGH the WHERE-TO-BUY SECTION

for local stocks, chemicals, raw materials, equipment, supplies, etc.



# READER SERVICE . . . . .

## HOW TO USE COUPON

Mail the coupon at the bottom of page. Circle page numbers of items about which you want more details. Then write your name and address and mail it to us. Your request will be forwarded to companies concerned, the answer coming direct to you.

## MAKES IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

## THE NUMBERS

**Advertisements:**—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

**Editorial Items:**—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

## EDITORIAL ITEMS

For more data, circle number on coupon.

### NEW PRODUCTS

Anthrone-9,10-dihydroketo-anthracene 21A

### NEW EQUIPMENT

Air Lock Feeder 23F  
Check Valve 23D  
Combustible Gas Alarm 23C  
Flow Interlock 23E  
Metal Analysis 23B  
Pyrite Roaster 22A  
Wash Bottle 23A

### TECHINICAL LITERATURE

#### CHEMICALS

Liquifier 36B  
Lubricants 36A

#### EQUIPMENT

Accelerated Cavitation 36D  
Condenser Tubes 36C  
Conveyor Chains 36F  
Dust Suppressor 36K  
Insulating Fire Brick 36J  
Oil Burners 36H  
Pump Controls 36I  
Refractometer 36E  
Stainless Steel Tubing 36G

## PRODUCTS ADVERTISED

For more data, circle number on coupon

### Chemicals

Acculute B1a  
Acetic acid 16d  
Acetic anhydride 16a  
Acrolein, bulletin F7389 38a  
Allyl alcohol, booklet I  
Aluminum hydroxide gels 28  
Ammonium silico fluoride T33a  
Butyric acid 16c  
Copper sulphate T3a, 14  
Crotonic acid 16b  
Cryslyic acid 24  
DDT 13  
Driers 23a  
Emulsifiers T1c  
Lithium compounds B3  
Magnesium carbonates B36a  
Magnesium hydroxides B36b  
Magnesium oxides B36c  
Magnesium silico fluoride T33b  
Methacrolein, bulletin F-7620 38b  
Monochloracetic acid T3b  
Monochloracetic sodium T3c  
Napthalene T3d  
Phosphoric acid 18  
Plasticizers T1a, 23c  
Potassium bichromate 8c  
Shellac, dewaxed 2a  
Sodium bichromate 8a  
Sodium chromate 8b  
Sodium sulphate 8d

Softeners T1b  
Stabilizers 23b  
Sulphur dioxide 22

Closures, drum 37  
Electrodes, pH, glass 21  
Engineering & construction, plants, sulfuric acid from refinery sludge 7  
Matting, safety tread 15  
Motors, laboratory 27  
Plant facilities, available in Louisiana B27  
Pumps, corrosion resistant, impervious graphite 4  
Test papers, pH, accutint B1b  
Thermometers, laboratory, bulletin "C" 17

### Waxes

Beeswax 2d  
Candelilla 2c  
Japan wax, carnauba 2b

## SEARCHLIGHT SECTION

(Classified Advertising)

### EMPLOYMENT

Selling Opportunities Wanted 34

### BUSINESS OPPORTUNITIES

Offered 34

Wanted 34

### EQUIPMENT

(Used or Surplus New)

For Sale 34

### ADVERTISERS INDEX

Consolidated Products Co., Inc. 34  
Equipment Clearing House, Inc. 34  
Jasper Machinery Co. 34  
Perry Equipment Corp. 34

## READER SERVICE COUPON

Mail to Chemical Industries Week, 330 W. 42nd St., N. Y. 18, N. Y.

NAME \_\_\_\_\_

POSITION \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY & STATE \_\_\_\_\_

### Editorial Items

36A 36E 36I  
36B 36F 36J  
36C 36G 36K  
36D 36H

### Advertisements

I	B1a	2c	T3c	7	8d	16a	17	23a	B27	B36b
T1a	B1b	2d	T3d	8a	13	16b	18	23b	28	B36c
T1b	2a	T3a	B3	8b	14	16c	21	23c	T33a	37
T1c	2b	T3b	4	8c	15	16d	22	24	T33b	38a
								T27	B36a	38b

Expires July 7, 1951

# BOOKLETS . . . . .

## Chemicals

### Lubricants

4-p. bulletin giving technical information on extreme bearing pressure lubricants in which the basic lubricity ingredient is a specially prepared and purified molybdenum disulfide compound having the capacity to prevent galling and seizing at bearing pressures over 100,000 pounds per square inch. The Alpha Corp.

### Liquefier

Technical bulletin on "Azite 900" liquefier describing the properties of the compound and its uses in the paper manufacturing and paper coating industries. Industrial Chemicals Div., American Cyanamid Co.

## Equipment

### Condenser Tubes

28-p. illustrated brochure on condenser tubes reports on intensive research done on causes of corrosion and means of combating them, describes the choice of condenser tube materials and the importance of radio-active tracer procedures in regard to these materials. A table is included giving estimating data for condenser and heat exchanger tubes in various alloys. Revere Copper and Brass, Inc.

### Accelerated Cavitation

20-p. booklet discussing cavitation-pitting tests conducted to solve some of the phenomena of cavitation and to determine the relative resistance to pitting of recently developed materials and techniques for applying these materials; the tests were made by means of an accelerated cavitation machine of the vibratory type. Allis-Chalmers Mfg. Co.

### Refractometer

4-p. pamphlet with information and illustrations concerning the operation, theory and application of the firm's robotic refractometer used for automatic control of industrial process streams and batches by measurement of their refractive indexes. Minneapolis-Honeywell Regulator Co.

### Conveyor Chains

12-p. booklet covering various applications of chain conveyors and attachments but focusing attention on the correct method for conveying or handling a product and the importance of the careful selection of chain conveyors in instances where they apply—all discussed from the viewpoint of economy and efficiency. Chain Belt Co.

### Stainless Steel Tubing

4-p. bulletin outlining the physical and mechanical characteristics of three non-hardening straight chromium stainless tubing steels with technical data on analysis, creep strength, corrosion resistance, forging, machining, etc. Babcock & Wilcox Tube Co.

### Oil Burners

Bulletin describing long nose type, low pressure air atomizing oil burners especially designed for applications where the burner nozzle must extend into the furnace for some distance so that the flame will start farther away from the firing wall. Hauck Mfg. Co.

### Pump Controls

4-p. bulletin on pressure operated pump controls that automatically maintain water levels in elevated tanks, explains the reasons for using two bellows for control instead of the usual single design, along with the results to be expected from this type of control. Automatic Control Co.

### Insulating Fire Brick

4-p. illustrated folder presenting the economic advantages, industrial applications and refractory properties of this product which is capable of sustained use at 3000 F in direct exposure or back-up service. Johns-Manville.

### Dust Suppressor

4-p. illustrated bulletin featuring bag-type suppressor of dust, fumes, and smoke for use in foundries and other metallurgical applications as well as for chemicals, plastics, and other industries where dust emission must be controlled. Whiting Corp.

## ADVERTISER'S INDEX

Advance Solvents & Chemical Corp.	23
American Flange & Manufacturing Co., Inc.	3rd Cover
American Mat Corp.	15
Beckman Instruments, Inc.	21
Carbide & Carbon Chemicals Co., A Division of Union Carbide & Carbon Corp.	Back Cover
Chemical Construction Corp.	7
Concord Chemical Co.	24
Diehl & Co., William	2
E. & M. Enterprises, Inc.	T27
Kessler Chemical Co., Inc.	T1
Kolker Chemical Works, Inc.	13
Marine Magnesium Products Division, Merck & Co., Inc.	36
Metalloy Corp.	B3
National Carbon Co., A Division of Union Carbide & Carbon Corp.	4
Natural Products Refining Co.	8
Phelps Dodge Refining Corp.	14
Precision Thermometer & Instrument Co.	17
Reheis Co., Inc.	28
Rosenthal Bercoff Co., Inc.	T3
Sargent & Co., E. H.	B1
Shell Chemical Corp.	2nd Cover
State of Louisiana, Department of Commerce & Industry	B27
Sundheimer Co., Henry	T33
Tennessee Corp.	22
Tennessee Eastman Co., A Division of Eastman Kodak Co.	16
Union Carbide & Carbon Corp., Carbide & Carbon Chemicals Co.	Back Cover
Victor Chemical Works	18

## BUSINESS STAFF

SALES MANAGER	By Sawyer
BUSINESS MANAGER	Albert E. Weis
Atlanta	Ralph C. Maulsby, 1311 Rhodes-Haverty Bldg., Atlanta 3, Ga.
Chicago	Alfred D. Becker, Jr., Frank C. Mahne, Jr., 520 N. Michigan Ave., Chicago 11, Ill.
Cleveland	Vaughan K. Dissette, 1510 Hanna Bldg., Cleveland 15, Ohio
Dallas	Jos. H. Allen, First Natl. Bank Bldg., Dallas 1, Texas
Los Angeles	Carl W. Dysinger, H. L. Keeler, 1111 Wilshire Blvd., Los Angeles 17, Cal.
New York	Knox Armstrong, Robert S. Muller, Charles L. Todaro, 330 West 42 St., New York 18, N. Y.
Philadelphia	William B. Hannum, Jr., Architects Bldg., 17th & Sansom Sts., Philadelphia 3, Pa.
San Francisco	Ralph E. Dorland, John W. Otterson, 68 Post St., San Francisco 4, Calif.
Boston	1427 Statler Bldg., Boston 16
Detroit	2980 Penobscot Bldg., Detroit 26
Pittsburgh	738 Oliver Bldg., Pittsburgh 22
St. Louis	3615 Olive St., Continental Bldg., St. Louis 8

Chemical Industries Week

**M**agnesium salts from the sea

**MAGNESIUM CARBONATES HYDROXIDES OXIDES**

ORIGINAL PRODUCERS OF MAGNESIUM SALTS FROM SEA WATER



**MARINE MAGNESIUM PRODUCTS**  
DIVISION OF MERCK & CO., INC.

Main Office, Plant and Laboratories  
SOUTH SAN FRANCISCO, CALIFORNIA

Distributors:

WHITTAKER, CLARK & DANIELS, INC.  
260 West Broadway, New York

CHICAGO: Harry Holland & Son, Inc.

CLEVELAND: Palmer Supplies Co.

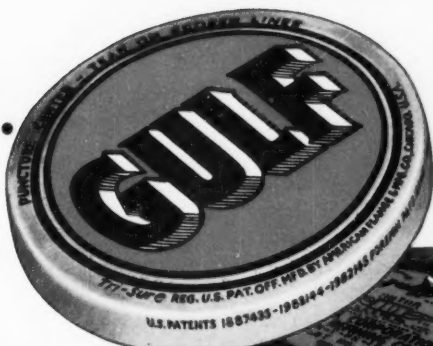
TORONTO: Richardson Agencies, Ltd.

G. S. ROBINS & CO.  
126 Chouteau Avenue, St. Louis

THE C. P. HALL CO.  
Alton, Chicago, Los Angeles

36

# 1932...



# ...1951

**Year after year  
on drum after drum**

**GULF**  
is protected by  
**Tri-Sure Closures**

**B**ACK in 1932, when Tri-Sure Closures\* were first introduced, the Gulf Oil Corporation started to use them to protect their products from leakage, substitution and pilferage.

For 19 years, Gulf has been sending shipment after shipment—to customers all over the world—in drums equipped with Tri-Sure Closures.

The fact that Gulf, one of the world's largest shippers of oil and gasoline, is entrusting its famous products to Tri-Sure Closures is evidence of the complete dependability of the Tri-Sure Flange, Plug and Seal.

Give your product Tri-Sure protection—relied on as insurance against leakage and losses by the world's leading shippers. On your next drum order specify "Tri-Sure Closures"—and make every shipment a safe shipment.

\*The "Tri-Sure" Trademark is a mark of reliability backed by 28 years serving industry. It tells your customers that genuine Tri-Sure Flanges (inserted with genuine Tri-Sure dies), Plugs and Seals have been used.



## Tri-Sure



### CLOSURES

**AMERICAN FLANGE & MANUFACTURING CO. INC., 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.**  
**TRI-SURE PRODUCTS LIMITED, ST. CATHARINES, ONTARIO, CANADA**



*Now available to industry!*

## ACROLEIN

$$\text{CH}_2=\text{CHCHO}$$

**FOR:**

- Pharmaceuticals**—methionine, 2-amino-pyrimidine, folic acid, and substituted quinolines.
- Odorants**—by Diels-Alder condensations.
- Coating Resins**—reaction with urea, thiourea, and polyhydric compounds.

## METHACROLEIN

$$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2=\text{CCHO} \end{array}$$

**FOR:**

- Copolymers**—with acrylonitrile, acrylic esters, and styrene—they have high softening points and good solvent resistance.
- Resins**—for impregnated fabrics, linoleum, and adhesives.


56.06	.....Molecular Weight	.....70.09
0.8427	.....Specific Gravity at 20/20°C.	.....0.8474
52.6°C.	.....Boiling Point at 760 mm. Hg.	.....68.0°C.
215 mm.	.....Vapor Pressure at 20°C.	.....120 mm.
<0°F.	.....Flash Point (Cleveland open cup)	.....5°F.
20.8% by wt.	.....Solubility in Water at 20°C.	.....5.9% by wt.
6.8% by wt.	.....Solubility of Water in at 20°C.	.....1.7% by wt.

**ACROLEIN** and **METHACROLEIN** are highly reactive intermediates. They undergo reactions characteristic of both unsaturated compounds and aldehydes. The conjugation that exists between the double bond and the unsaturation of the carbonyl group increases the reactivity of both groups. These groups can be made to react either simultaneously or individually—the ethylenic groups with halogens, halogen acids, 1,3 dienes, alcohols, and mercaptans—the aldehyde groups with anhydrides and dibasic organic acids, Grignard reagents, alcohols, and HCN. Acrolein and methacrolein are shipped containing 0.1 per cent hydroquinone to inhibit polymerization.

For further information on either of these materials call or write the nearest Carbide and Carbon Chemicals office *today*. Ask for the technical bulletins "Acrolein" (F-7389) and "Methacrolein" (F-7620). These bulletins will provide you with additional data on the physical and chemical properties of acrolein and methacrolein. They will also serve as a permanent reference for your work.

**CARBIDE AND CARBON  
CHEMICALS COMPANY**

A Division of  
Union Carbide and Carbon Corporation  
30 East 52nd Street NEW YORK 17, N. Y.



Offices in Principal Cities  
In Canada:  
Carbide and Carbon Chemicals, Limited, Toronto